THE Journal

OF THE AMERICAN DENTAL ASSOCIATION

JUNE

1953

CONTENTS

Protection against roentgen-ray radiation—Reich 615
Diagnostic use of laminagraphy—Ricketts 620
Studies of dentofacial morphology. III—Pelton 648
Mouth breathing—Massler 658
Prosthodontist and the temporomandibular joint—Block 671
Fédération Dentaire Internationale—Oliver 674
Congress on dental education and licensure—Buhler 678
Cases and comments 687
Reports of councils and bureaus 690
Editorials 694
Washington news letter 697
News of dentistry 699
The reader comments 716
Book reviews 719
Current literature 728
Deaths 733
Directory 736
Announcements 739

NINETY-FOURTH ANNUAL SESSION

VOLUME 46
NUMBER 6

CLEVELAND • SEPT. 28 • OCT. 1

Presenting two new prosthetic aids of major importance in your full and partial denture practice

THE TRUBYTE Bioform MOULD GUIDE

You'll want this new Trubyte Bioform Mould Guide for a number of reasons – but mostly for the great convenience it provides to the busy practitioner. It will enable you to quickly and accurately select teeth for your full and partial dentures. It will save you time and money in resets and remakes. Here in one attractive case are all the available upper and lower anterior moulds of Trubyte Bioform Teeth, with complete information on dimensions and articulations.

THE TRUBYTE Bioform SHADE SELECTOR ASSORTMENT

Here is the easy and practical way to select shades for full and partial dentures. It practically eliminates the resets, remakes and disappointments that often follow selection with a single shade guide tooth. Why not try this practical prosthetic aid today. It contains 1 x 6 of the twelve shades of the Trubyte Bioform Natural Tooth Color System – the only fully correlated system which offers a full range of selection for all ages and complexions.

THE DENTISTS' SUPPLY COMPANY OF NEW YORK

YORK, PENNSYLVANIA

FIRMILAY

REG. U.S. PAT. OFF.

Perfect for Acrylic Veneer Crown Castings!

A Jelenko Precision Casting Gold, ideal for reproducing the fine margins and details of veneer crown castings.

Strength and Hardness amply adequate to stand up under incisal or occlusal loads and abrasion.

Certified to meet A.D.A. Specification No. 5 for TYPE C–HARD Golds.

GOLD COLOR

per dwt. — $2.15

Use "FIRMILAY" also for All Crown and Inlay Abutments. Easily Burnished in Quenched Condition.

Recommended for Short-Span Stationary Bridges when Heat Hardened.

SCIENTIFICALLY SAFE — J. F. JELENKO & CO. — FOR STRUCTURAL STRENGTH

Cast by THERMOTROL

J. F. Jelenko & Co., Inc.

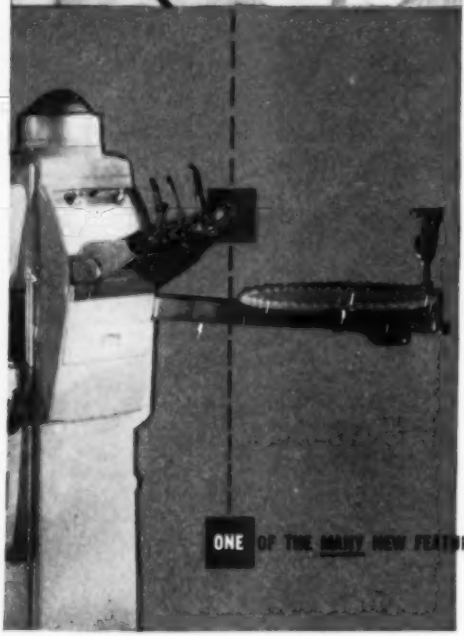
DENTAL GOLDS—SPECIALTIES—PRECISION CASTING EQUIPMENT

136 West 52nd Street • New York 19, U. S. A.

The Journal of the American Dental Association, Vol. 46, No. 6. Published by the American Dental Association, 222 E. Superior St., Chicago 11, Ill. Yearly subscription $7.00 for U. S. and possessions; $8.00 for foreign countries. Single copy seventy-five cents. Entered as second-class matter, December 31, 1947, at the postoffice at Chicago, Ill., under the act of March 3, 1879. Published monthly. Copyright 1953 by the American Dental Association. The Journal of the American Dental Association is indexed in the Index to Dental Literature, in the Current List of Medical Literature and, in part, in the quarterly Cumulative Index Medicus, Biological Abstracts and Chemical Abstracts.

SAFE! . . . ACCURATE! . . . EASY TO OPERATE!

New Electronic Pulp Tester



EXCLUSIVE ON THE ALL-NEW RITTER UNITS

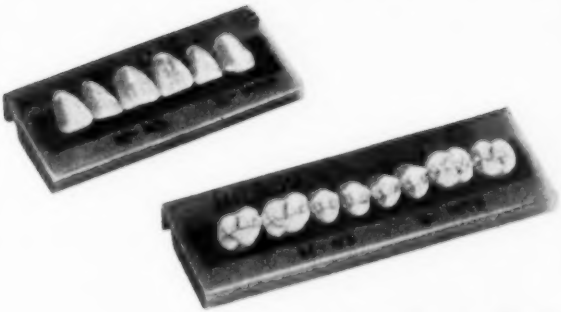
Now, a revolutionary new pulp tester to make your work easier. The new Ritter Electronic Pulp Tester has a single, positive control on the handle. No switches involved. The finger-tip operation of the knurled sleeve, with calibrated dial, assures accurate control of current. A neon light in the transparent tip glows when contact is established . . . a positive indication that the pulp tester is in operation. A single electrode in the tip makes possible easier contact with small areas of the tooth.

Visit your Ritter Distributor and see a demonstration of this revolutionary new electronic pulp tester.

Ritter
COMPANY INCORPORATED
BUILT UP TO A STANDARD NOT DOWN TO A PRICE

RITTER PARK, ROCHESTER 3, N.Y.

ONE OF THE MANY NEW FEATURES ON THE SENSATIONAL ALL-NEW RITTER UNITS!



GIVE YOUR PATIENTS
THE NATURAL CHARM OF

Micromold® Teeth

PORCELAIN TEETH WITH NO PIN LINE

for patients who want to look better and eat better . .

Obtain or Prescribe Dentistry's Most Lifelike Teeth At VITALLIUM® Laboratories

AUSTENAL LABORATORIES, INC.
NEW YORK CHICAGO

® by AUSTENAL LABORATORIES, INC.

To the point—and up-to-date!

BEUBE:

Periodontology

DIAGNOSIS AND TREATMENT

Here is an up-to-date text and reference on the clinical aspects of periodontology, written by one of our foremost specialists in this field, Frank E. Beube, D.D.S., Head of the Periodontology Division, Columbia University Dental School.

Covering the etiology, pathology, diagnosis and methods of treatment of diseases of the dental tissues, this latest text includes step by step descriptions with many photographs and tables.

The dental profession, undergraduate and practitioner alike, will find the inclusion of *technical hints* in special display type a most helpful feature. 736 pp. Probably $15.00

DIAMOND:

Dental Anatomy

NEW THIRD EDITION

Including 65-page Atlas of the ANATOMY OF THE HEAD AND NECK

This is a completely revised and considerably enlarged edition of Diamond's original text and reference work. It contains 471 pages of outstandingly organized material, 300 illustrations and diagrams, and many full color plates.

Five new chapters have been added, the one on deciduous dentition amplified to include a study on the development of the deciduous and permanent buds and relative growth of surrounding tissues.

One of the most encompassing works of its nature, teachers, students and practicing dentists alike will find it invaluable in study and practice. 471 pp. $15.00

Order now at your bookstore or from

The Macmillan Company

60 FIFTH AVENUE, NEW YORK 11, N.Y.

DENSENE "33" for *STRONG* FULL AND PARTIAL DENTURES!

Densene dentures are delivered by laboratories in the attractive Densene box with this certificate

Densene "33"

a denture resin . . . compounded for extra strength . . . here is your *best* protection against denture breakage! Further, Densene "33" is also your safest specification for accurate adaptation, stability and freedom from "warpage" in prolonged mouth service.

AVAILABLE THROUGH YOUR OWN DEALER

COSMOS DENTAL PRODUCTS, INC. • 653 Eleventh Avenue • New York 36, N. Y.

Better cabinet; heavier metal, glass shelves, no dust-catching ridges

Cast bronze cover; stronger, better looking, less steaming

Tin-lined boiler cuts corrosion

Easy draining; no pipe cleaning tool required

Aluminum base—can't stain floor

Greater utility; bigger work space, drawer for bottles, trays

WE PAY ATTENTION TO DETAILS... SO *You* NEVER HAVE TO

Tending a slowpoke boiler . . . carrying things back and forth . . . waiting for repairs . . . details waste your time!

So Castle designed a sterilizer that helps you with its well-planned details. Space-Maker is fully automatic, completely convenient, and has the Castle extras that give you troublefree sterilizing.

But here's a way you can check for yourself: Ask your sterilizer serviceman which make of sterilizer gives him *least* trouble. Ten to one he'll say, "Castle."

For complete information, call your Castle dealer or write Wilmot Castle Co., 1104 University Ave., Rochester 7, N. Y.

Castle LIGHTS and STERILIZERS

like no other!

Specify ORYL BRAND.....

the First Really Improved Resin Denture Base Material

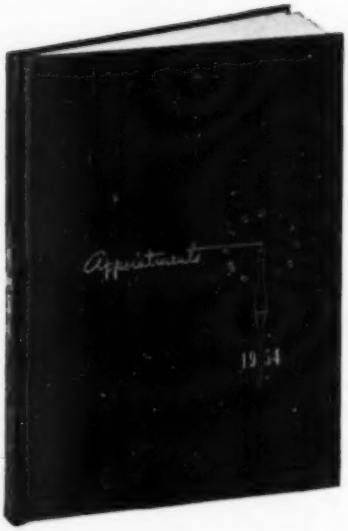
Only genuine ORYL Brand cases come to you in this protective container.

Beauty of Acrylics **PLUS** *Flexibility and Dimensional Stability of Vulcanite*

Not since the introduction of acrylics to dentistry has there been such an important improvement in denture resins! For ORYL Brand is a revolutionary, new scientific combination (pat. pend.) of finest resin materials properly blended to give dentures the beauty and strength of *acrylics* PLUS the flexibility and dimensional stability of *vulcanite*. Resists wear and breakage. Assures exact reproduction of detail and perfect adaptation to tissue. Gives long lasting perfect fit. Specify ORYL Brand on your future cases. Your laboratory has it now or can get it readily from his dealer.

Certified to meet A.D.A. Specification No. 12 for Denture Base Materials

THE WILLIAM GETZ CORPORATION
DENTAL PRODUCTS
7512 GREENWOOD AVENUE • CHICAGO 19, ILLINOIS



ada

THE 1954 A.D.A. APPOINTMENT BOOK is now available

If you aren't already on the standing order list, send in your order today.

Exclusive Features

- *A full week's appointments at a glance.*
- *Patient recall system.*
- *National holidays.*

use this order blank

Order Department, AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois

☐ *Please enter my order for_____ copies of (Catalogue No. M-2) A.D.A. Appointment Book for 1954 at $2.00 per copy. My remittance of $_____ is enclosed.*

☐ *Please notify me by mail each year when the Appointment Book is available. I understand there is no charge for this service.*

name _____

address _____

city, zone & state _____

please type or print

the name that means "alginate"

Wherever modern dentistry is practised, alginate impression materials are referred to as "D-P." You probably do it yourself!

THERE IS ONLY *ONE* "D-P"—Actually, the name "D-P" belongs to just *one* alginate—D-P Elastic Impression Cream, manufactured by Dental Perfection Company.

THE STANDARD OF THE PROFESSION—"D-P" has become a synonym for alginate because "D-P" is the standard by which other alginates are measured.

No other alginate can be claimed to be "just as good as D-P"—No other alginate can offer you such uniformly satisfactory results!

Order the one—and only—D-P from your Dental Dealer TODAY

dental perfection co.

543 West Arden Ave. • Glendale 3, California

For Penicillin Therapy in Dental Practice

just 1 or 2 tablets three times daily

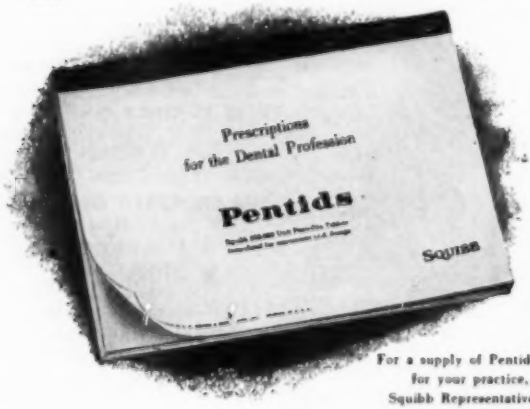
Pentids

Squibb 200,000 Unit Penicillin Tablets

For treatment of acute oral Vincent's disease as an adjunct to other appropriate dental procedures, and for prophylaxis against secondary infection before and after extraction and other dental surgery. When pre-existing cardiac lesions predispose to subacute bacterial endocarditis or there is extensive tissue trauma, parenteral penicillin should be given before or at time of extraction followed by Pentids therapy postoperatively.

Pentids—formulated for convenient t.i.d. dosage—contain the new 200,000 unit oral systemic penicillin dosage advocated by Keefer[1] and others.[2] Supplied in bottles of 12 and 100 scored, buffered tablets, each containing 200,000 units of crystalline penicillin G potassium. Pentids should be swallowed with water one-half hour before or at least two hours after meals.

1. Keefer, C. S., Postgrad. Med. 9:101, Feb. 1951
2. Flippin, H. F., and Israel, H. L., Med. Clin. North Amer. 34:1653, Nov. 1950



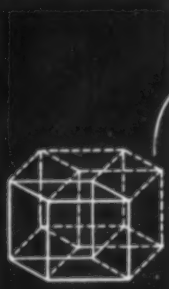
For a supply of Pentids prescriptions for your practice, ask your Squibb Representative or write to
E. R. Squibb & Sons
745 Fifth Ave., New York 22, N. Y.

SQUIBB A LEADER IN PENICILLIN RESEARCH AND MANUFACTURE

"PENTIDS" IS A TRADEMARK OF E. R. SQUIBB & SONS

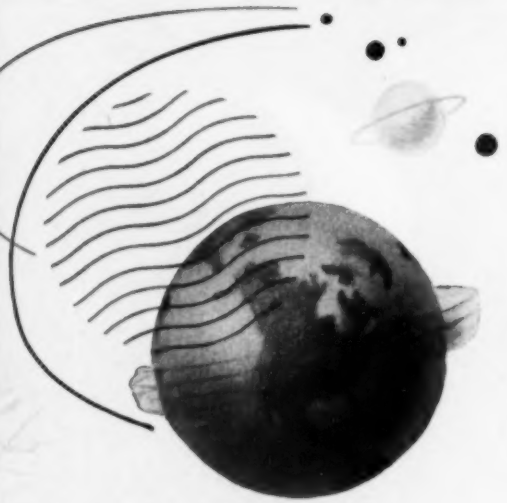
As a practicing dentist, YOU are probably using one or more of the many popular Crescent products, materials and alloys that have been preferred by professional men for over half a century. But are you familiar with ALL of the Crescent qualities for *better* dentistry, for *minimizing* chairtime, for making your daily procedures more *pleasant* and *profitable?* For example: are you making fillings with Cres'lver or Silverloy, triturating amalgam with the Wig-l-bug, employing Crescent brushes, and cups, taking impressions with Crescent trays, mounting models on Crescent articulators? If not, chances are Crescent has much to make your daily practice more rewarding. Write for details.

CRESCENT DENTAL MANUFACTURING CO.
1839 South Pulaski Road, Chicago 23, Illinois



"The Tesseract, or Tetra-Hypercube: a 4-space figure generated by the movement of a cube in the direction (to us unimaginable) of the 4th dimension***"†

†Bragdon, C.: A Primer of Higher Space, New York, Alfred A. Knopf, 1923, Plate 1.



Local anesthesia

IN FOUR DIMENSIONS...

XYLOCAINE® HYDROCHLORIDE

ASTRA

(Brand of lidocaine hydrochloride*)

WELL TOLERATED

QUICK ACTING

POTENT

HIGHLY STABLE

SUPPLIED

Stocked by leading dental supply dealers as a 2% solution, without epinephrine and with epinephrine 1:100,000 or 1:50,000; dispensed in 1.8cc cartridges, packed 50 cartridges to a vacuum-sealed tin. Also available in 20cc multiple dose vials packed 5 vials to a carton.

Latitude and longitude (spread) and depth might adequately define ordinary local anesthesia. The fourth dimension, or time, is essential to preferred local anesthesia, especially as related to the waiting period between injection and onset of anesthesia. With Xylocaine Hydrochloride (Astra), anesthesia is so rapid in onset,† that minutes of "waiting time" are routinely converted to hours of "working time".

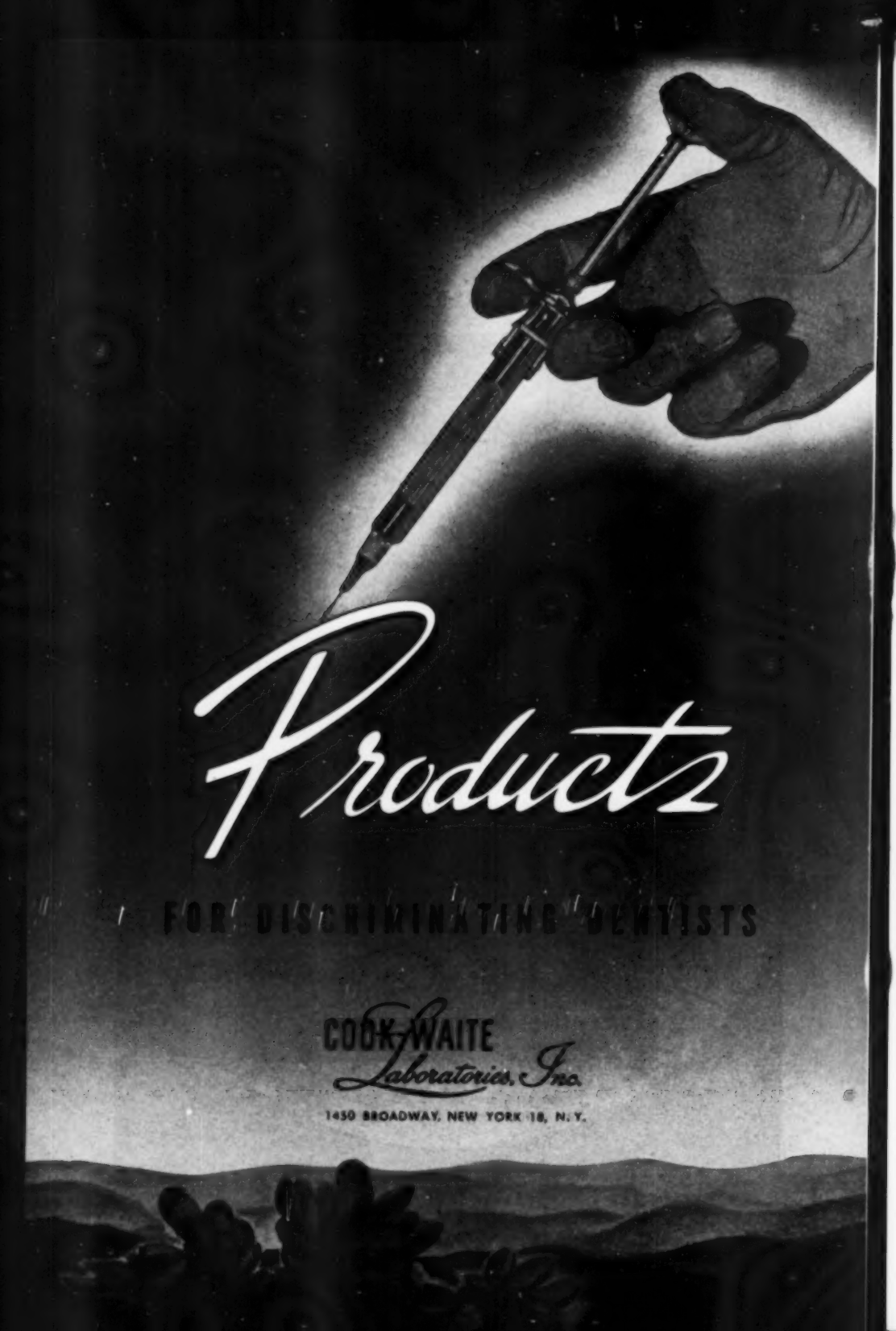
†"It was his opinion (the Dean of the Dental College at Stockholm) that this rapidity of onset saved each dentist who saw between 12 and 40 patients per day, one hour of waiting time" . . . Hingson, R.A., N.Y. J. Dent., 30:370 (Oct.) 1950.

Literature and Samples Sent on Request

ASTRA PHARMACEUTICAL PRODUCTS, INC.
WORCESTER, MASS. U.S.A.

*U.S. Pat. No. 2,441,498

TOPS AS
A TOPICAL
5%
XYLOCAINE
BRAND OF LIDOCAINE
OINTMENT
ASTRA
XYLOCAINE®
(Brand of lidocaine*)
OINTMENT
ASTRA
QUICK-ACTING — PROFOUND
NON-IRRITATING
An effective topical anesthetic for use in the oral cavity. Circumvents patient apprehension prior to injection. Minimizes discomfort during normally painful deep scaling procedures. Useful wherever freedom from pain is an essential prerequisite to complete patient cooperation.
Write For Professional Sample
and Descriptive Literature.
Stocked by leading dental
supply houses in 35 gram
wide-mouth glass jars.
ASTRA PHARMACEUTICAL PRODUCTS, INC.
WORCESTER, MASS. U. S. A.


Products
FOR DISCRIMINATING DENTISTS
COOK-WAITE
Laboratories, Inc.
1450 BROADWAY, NEW YORK 18, N. Y.

. . . here

— a Steele's Denture Backing (with reinforcing bar) provides strength and rigidity for the narrow isthmus of denture material, and a strong attachment for the tooth.

and here

— reinforcing bars are not necessary. The embedded lingual sleeve of the backing makes a very strong attachment. Ideal for both SHORT and CLOSE bite cases; for a Steele's facing is *thinner* in its labial-lingual dimension than a denture tooth.

Steele's INTERCHANGEABLE FACINGS WITH Denture Backings

THE COLUMBUS DENTAL MFG. CO. • COLUMBUS 6, OHIO

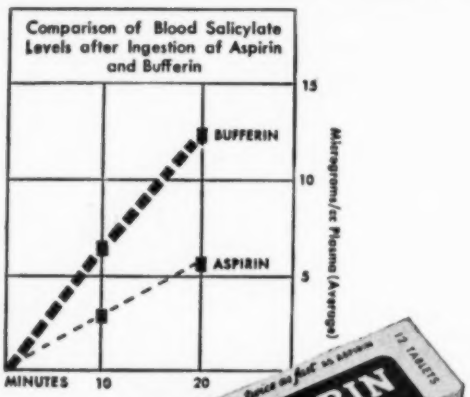
Doctor, I have a toothache!

When dental pain strikes, the patient thinks first of you. At midnight or 6 A.M., or in the midst of a busy day, your patient expects you to do something for her—immediately.

For *faster pain relief* recommend BUFFERIN, the antacid analgesic, which *acts twice as fast as aspirin.* Within 10 minutes after BUFFERIN is taken, the blood salicylate levels are higher than those attained by aspirin in twice this time.

BUFFERIN is antacid, too. Whether given in small or large doses, BUFFERIN rarely produces gastric distress.

Use BUFFERIN before and after extractions and along with other therapy to minimize discomfort.



BUFFERIN®

ACTS TWICE AS FAST AS ASPIRIN
DOES NOT UPSET THE STOMACH

EACH BUFFERIN TABLET contains 5 grains of acetylsalicylic acid, together with optimum amounts of the antacids aluminum glycinate and magnesium carbonate.

BRISTOL-MYERS CO., 19 W. 50 St., New York 20, N. Y.

JUNE 1953

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

VOLUME 46 • NUMBER 6

Protection against radiation from dental x-ray apparatus

Bernard Reich, B.S., Fort Monmouth, N. J.

The martyrs of days past were responsible for incorporating protective features into the design and construction of x-ray equipment. Most of these provisions were concerned with protection against primary roentgen-ray radiation; as yet little consideration has been given to secondary or stray radiation. For the operator of x-ray apparatus, danger may exist in exposure to stray radiation over a long period of time as well as in exposure to primary radiation as a result of inadequate shielding or disregard for safety requirements.

With the advent of the shockproof features of x-ray equipment, practically all electrical dangers have been eliminated; however, roentgen-ray hazards still exist. It is a widely known fact that a single exposure to a large amount of roentgen-ray radiation or repeated exposures to small amounts may produce tissue injuries such as dermatitis, endothelial changes, ulcer formation or neoplastic developments of the skin, destruction of the blood cells, inhibition of the hematopoietic system (with the production of anemia or leukopenia), neoplastic and hematopoietic changes (with the production of leukemia) and inhibition of glandular activities.

TOLERANCE DOSAGE

In 1936 the U. S. Advisory Committee on X-Rays and Radium Protection after considering all available information concluded that the maximum tolerable amount of x or gamma radiation which the whole body can absorb on successive working days is .1 r.

In 1949 the U. S. National Committee on Radiation Protection recommended that the specified tolerance limit be reduced from 500 to 300 milliroentgens per week.

It should be understood that these dosages mentioned are total body radiation

Signal Corps Engineering Laboratories.

dosages. While a dosage of 5,000 r can be used to treat a small skin cancer, with little or no permanent harmful effect, a dosage of 500 r total body radiation would be fatal to most human beings.[1]

In the remainder of this paper the term tolerance dose refers to that specified in the 1949 recommendations of the U. S. National Committee on Radiation Protection.

INITIATION OF INVESTIGATION

The Health Physics Group, Evans Signal Laboratory, is responsible for the radiological health and safety of the Signal Corps Engineering Laboratories and Fort Monmouth. This responsibility covers the use of radioactive isotopes and of equipment producing roentgen-ray radiation.

Prior to any area surveys, all roentgen-ray technicians were issued film badges, calibrated to the energy of radiation emanating from the x-ray apparatus. It was found that the dental roentgen-ray technicians were receiving from 300 to 500 milliroentgens per week, an amount above tolerance.

An area survey disclosed the following information:

1. Technicians and practitioners were not aware of the amount of stray radiation emanating from the sides and back of the machine. An additional contribution to the dosage of the operator was the scattered radiation from the walls of the room used for roentgenography.

The room used for oral roentgenography at Fort Monmouth is approximately 8 feet by 10 feet. Most of the radiation is directed at either of two walls, of which one is lead-lined and the other has a covering of ¼ inch plywood. It was noted during the course of measurements that the back scattering from the plywood was approximately three times that from the lead wall.

2. The technician was not operating behind a lead screen as prescribed by the National Bureau of Standards in Paragraph 8.2.b, *Handbook No. 41, Medical X-Ray Protection Up to Two Million Volts.*[2] A ⅛ inch lead screen was available; however, because of the size of the room where oral roentgenograms are made, the use of a screen was burdensome and hindered the technician in the performance of his job.

RADIATION FROM DENTAL X-RAY APPARATUS

The data presented here were gathered at Fort Monmouth and at the office of a local practitioner. Table 1 is a compilation of the data obtained at Fort Monmouth. Table 2 represents the data obtained from the machines of the local practitioner. An arbitrary distance of 18 inches was chosen for the point of measurement. It was assumed in these measurements that the operator would be at least 90° and possibly 180° from the useful beam with the machine in normal operating position. For the purpose of this report, reference to the type of apparatus is made by symbol only.

Since dental x-ray apparatus of Types A and B is used at Fort Monmouth, the measurements were made several times

Table 1 • Radiation* from Types A and B dental x-ray apparatus—distance 18"

Type	Position	Radiation mr/hr.
A	Right or left side 90° from useful beam	200
	Back side 180° from useful beam	8
B	Right or left side 90° from useful beam	300
	Back side 180° from useful beam	17

*Measured radiation consists of stray radiation from the machine plus back scatter.

1. Glasstone, Samuel. Sourcebook on atomic energy. New York, Van Nostrand Co., 1950.

2. Handbook No. 41, Medical X-ray protection up to two million volts. Washington, D. C., U. S. Department of Commerce, National Bureau of Standards, 1949.

and are considered more accurate than those made on Types C and D apparatus.

THE PROBLEM

If a technician using an apparatus of Type A or B placed himself 18 inches away from the machine, he would be able to operate for approximately one hour per week without receiving more than the tolerance dose of radiation.

Examination of the records at Fort Monmouth indicated that the apparatus was in operation for approximately 3,800 seconds or one hour and three minutes per month. Consequently, the data seemed to indicate either that the technician whose film badge showed tolerance dose or greater had been closer than 18 inches to the x-ray head during operation or that the back scatter from the wooden walls contributed greatly to the dosage.

The problem therefore was to shield the operator from stray radiation. If a lead screen were to be used, adequate protection could be afforded the operator. It was found, however, that the lead screen was for the most part too cumbersome and hindered the operator during the exposure of the film. The only other solution was to shield the head of the machine itself and to cover the walls with lead sheet and thus to afford the operator maximum protection during film exposure without the inconvenience of the lead screen.

DENTAL X-RAY MACHINE RADIATION MASK

The solution of the second portion of the problem, that is, the covering of the walls with lead to reduce back scatter was simple. The problem of shielding the dental x-ray head requires some explanation.

A lead radiation protective mask was designed and constructed to shield Type A and Type B apparatus. (See illustration.) The mask was made of ⅛ inch thick lead sheet with a projection around the cone to protect the operator from radiation diverging from the cone. The ⅛ inch thickness was chosen to provide structural durability and at the same time to give sufficient protection from radiation.

Table 2 • Radiation* from Types C and D dental x-ray apparatus—distance 18"

Type	Position	Radiation mr/hr.
C	Right or left side 90° from useful beam	160
	Back side 180° from useful beam	90
D	Right side 90° from useful beam	420

*Measured radiation consists of stray radiation from the machine plus back scatter.

The mask contains two components (illustration, center and below). The front portion is the radiation protector, thus placed because it was found that most of the stray radiation emanates in a plane tangential to the front face of the dental x-ray head. The other component is a counter balance for the lead on the front face of the x-ray head.

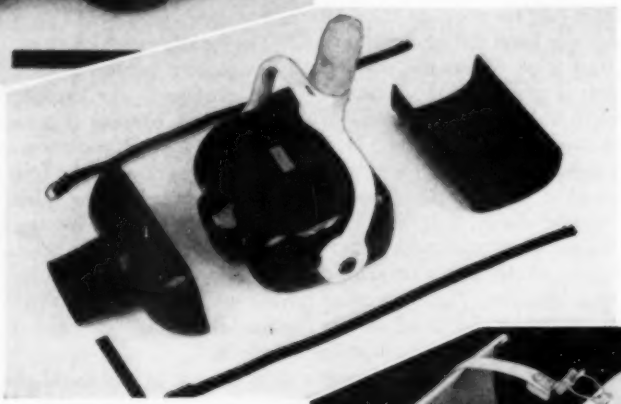
The amount of radiation emanating from a Type A or a Type B machine when the mask is used is shown in Table 3.

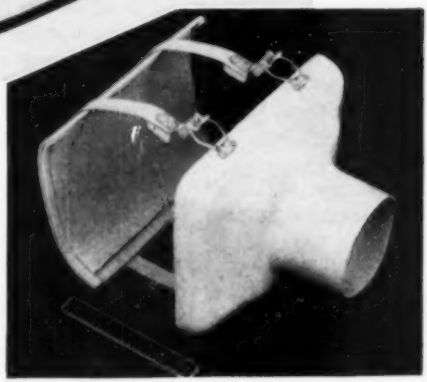
By the use of the shield the amount of radiation has been reduced to from a fifth to a seventh of the amount without a shield; that is to say that the technician who was formerly exposed to 300 milliroentgens per week now will be exposed to from 40 to 60 milliroentgens per week, an exposure well under rather than over the tolerance level.

COMMENT

Although the bulk of this investigation was conducted at Fort Monmouth, a military installation, it is the opinion of the writer that problems of this sort exist in private dental offices and have not been stressed sufficiently to impress the

Dental x-ray protective shield





Above: Dental x-ray machine head covered with shield. Center: Head and components of shield. Below: Assembled shield

dentist with the resultant roentgen-ray hazard to himself or to his assistants.

In this study the following conclusions were reached:

1. If the dentist or his technician is properly shielded as prescribed by the Bureau of Standards in *Handbook No. 41*,[3] adequate protection is afforded; however, since most practitioners and technicians, for one reason or another, do not comply with these regulations, they are exposing themselves unduly to stray radiation.

2. The use of a lead screen as a shield protects the operator from stray radiation; but in most cases because of limitations in space and awkwardness in use, the operator dispenses with the screen.

Table 3 • Radiation* from Types A and B dental x-ray apparatus—with mask—distance 18"

Type	Position	Radiation mr/hr.
A	Right or left side 90° from useful beam	40
	Back side 180° from useful beam	NONE
B	Right or left side 90° from useful beam	40
	Back side 180° from useful beam	NONE

*Measured radiation consists of stray radiation from the machine plus back scatter.

RECOMMENDATIONS

1. The shield described in this report shields dental x-ray machines without the inconvenience of a lead screen. Future designs should incorporate this principle directly during manufacture of the machines and thus free the technician and practitioner from inherent danger due to stray radiation.

2. Whenever back scatter presents a problem, efforts should be made to reduce it by the most practical methods.

Shortcomings of Specialization • Those engaged in arts and science, most Gracious Emperor Charles, find many obstacles to the exact study and successful application of them. In the first place, no slight inconvenience from too great separation between branches of study which serves for the perfection of one Art. But much worse is the mischievous distribution among different practitioners of the practical application of the art. This has been carried so far that those who have set before themselves the attainment of an art embrace one part of it to the neglect of the rest, although they are intimately bound up with it and can by no means be separated from it. *Vesalius (1542)*.

Laminagraphy in the diagnosis of temporomandibular joint disorders

Robert Murray Ricketts, D.D.S., M.S., Pacific Palisades, Calif.

Pathologic conditions in the temporomandibular articulation are evident in the earliest skulls of modern man.[1] In the ancient Egyptian writings[2] jaw dislocation is mentioned among the common medical problems. Cadaver dissection gave the first clues to normal joint function and mandibular movement. Advanced knowledge was gained by photographic investigations of extraoral devices attached to the mandibular teeth. Such a study by Luce[3] in 1889 demonstrated, contrary to common opinion, that the condyle in normal opening can move anterior to the articular eminence. In 1906, Chissin[4] pointed out the importance of the external pterygoid muscle in the opening movement of the mandible. This idea, which was later confirmed in numerous works, was at variance with descriptions in most anatomical texts,[5] which credited the opening movement solely to the hyoid musculature.

Prior and subsequent to Wolff's law of functional adaptation of bone,[6] claims were made that the form of the temporomandibular joint was determined by function of the teeth.[7-10] Todd,[11] however, placed significance on phylogenetic and hereditary factors, reasoning that the form of the entire jaw was related to the modification of the skull as man became upright. This view was supported by Brodie in his work on growth of the skull.[12, 13]

With the advent of roentgenography, an undistorted view of the temporomandibular articulation was found to be impossible because of the superpositioning of the petrous part of the temporal bone. Various angular technics began to be employed to reveal the joint structures. The first report of such possibilities was that of Sicher.[14] Thereafter, numerous technics were reported, all of which had

From the department of orthodontia, School of Dentistry; cleft palate training program and center; and department of radiology, School of Medicine, University of Illinois, Chicago.

Based on a presentation before the Annual Midwest Dental Medicine Seminar 1950.

1. Ruffer, Sir Armand. Study of abnormalities and pathology of ancient Egyptian teeth. Am. J. Phys. Anthropol. 3:335 July-Sept. 1920.

2. Breasted, J. H. Edwin Smith surgical papyrus. Chicago, University of Chicago Press, 1930.

3. Luce, C. E. The movements of the lower jaw. Boston Med. & Surg. J. 121:8 July 4, 1889.

4. Chissin, C. Über der Öffnungsbewegung des Unterkiefers und die Beteiligung der äusseren Pterygoidmuskeln bei derselben. Arch. f. Anat. u. Physiol. 30:41, 1906.

5. Gray, Henry. Anatomy of the human body, ed. 24, Lewis, Warren H., editor. Philadelphia, Lea & Febiger, 1942.

6. Wolff, Julius. Das Gesetz der Transformation der Knochen. Berlin, A. Hirschwald, 1892.

7. Tomes, Charles S., and Dolamore, W. H. Some observations on the motions of the mandible. D. Record 21:262, 1901.

8. Riesner, Sidney E. Temporomandibular reactions to occlusal anomalies. J.A.D.A. 25:1938 Dec. 1938.

9. Breitner, Carl. Bone changes resulting from experimental orthodontic treatment. Am. J. Orthodont. & Oral Surg. 26:521 June 1940.

10. Moses, C. H. Mandibular movements and the arrangement of teeth. J. Canad. D. A. 12:3 Jan. 1946.

11. Todd, T. Wingate. Facial growth and mandibular adjustment. Internat. J. Orthodont. 16:1243 Dec. 1930.

12. Brodie, A. G. The temporo-mandibular joint. Illinois D. J. 8:2 Jan. 1939.

13. Brodie, A. G. On the growth pattern of the human head, from the third month to the eighth year of life. Am. J. Anat. 68:209 March 1941.

14. Hildebrand, G. Y. Studies in masticatory movements of human lower jaw. Skandinav. Arch. f. Physiol. (Suppl.), 1931.

as their objective the avoidance of the dense bone of the temporal complex.[15-18]

Most reference texts for diagnosis[19] accept descriptions of the temporomandibular joint which are based on observations of roentgenograms made with these angular technics. In these descriptions it appears that no controlled samples were used for comparison, since none were reported.[20] This method was improved by Norgaard[21] who, by injecting disclosing agents into the joint cavities, made visible the involvement of the miniscus in pathological cases.

A thorough investigation of mandibular movements was reported by Hildebrand.[14] His combined roentgenographic and photographic technics permitted the study of movements of the mandible together with those of the condyle in all three planes of space. The main contribution of this work to the knowledge of mandibular behavior was the principle that the teeth dictate the movements of the mandible in the final phase of closing; however, Hildebrand did not concern himself with the position of the condyle in the fossa.

A recent attack on the problem of mandibular position was made through cephalometric roentgenology by Brodie and Thompson[22] and again by Thompson.[23] The results of these observations indicated that the mandible as a part of the postural system is positioned by the muscles running to it from above and below and that this position is influenced only slightly by the presence or absence of teeth. After these studies, the rest position came to be the accepted point of reference in most analyses.[24] Condylar position in the fossa, however, could not be determined in cephalometric roentgenograms.

LAMINAGRAPHY

The laminagraphic x-ray machine was originated by Kieffer[25] and was developed to minimize superimposing structures in the roentgenogram. This mechanical focusing device permits the roentgen-ray visualization of a prescribed plane, and is especially applicable to examinations of the head, where overlying structures frequently obscure less dense areas in the roentgenogram. Although laminagrams of head structure had been obtained previously,[26,27] Brader[28] applied the principles of cephalometric roentgenography to those of laminagraphy and proved the method to be accurate for scientific investigation.

As an outgrowth of this work the author adapted cephalometric laminagraphy to a controlled investigation of the temporomandibular joint.[29] A head-positioning device was employed to orient the head and to assure the visualization of a sagittal plane through the center of the joint (Fig. 1, left below). The width of

15. Goodfriend, David J. Abnormalities of the mandibular articulation. J.A.D.A. 21:204 Feb. 1934.

16. Gillis, Robert R. Roentgen-ray studies of the temporo-mandibular articulation. J.A.D.A. 22:1321 Aug. 1935.

17. Lindblom, Gosta. Technique for roentgen-photographic registration of the different condyle positions in the temporomandibular joint. D. Cosmos 78:1227 Dec. 1936.

18. Higley, L. B. New and scientific method of producing temporomandibular articulation radiograms. Internat. J. Orthodont. 22:983 Oct. 1936.

19. Pancoast, H. K.; Pendergrass, E. P., and Schaeffer, J. P. The head and neck in roentgen diagnosis. Springfield, Ill., Charles C Thomas, 1940.

20. Goodfriend, David J. Symptomatology and treatment of abnormalities of the mandibular articulation. D. Cosmos 75:844 Sept. 1933.

21. Norgaard, Flemming. Temporomandibular arthrography. Copenhagen, Einar Munksgaard, 1947.

22. Brodie, A. G., and Thompson, J. R. Factors in the position of the mandible. J.A.D.A. 29:925 June 1942.

23. Thompson, J. R. Rest position of the mandible and its significance to dental science. J.A.D.A. 33:151 Feb. 1946.

24. Thompson, J. R. Oral and environmental factors as etiological factors in malocclusion of the teeth. Am. J. Orthodont. 35:33 Jan. 1949.

25. Kieffer, Jean. The laminagraph and its variations: applications and implications of the planigraphic principles. Am. J. Roentgenol. 39:497 April 1938.

26. Kurz, C. S. Practical method of producing roentgenograms for diagnosis and treatment of temporomandibular lesions. Illinois D. J. 12:446 Oct. 1943.

27. Bleiker, Ross F. Ear disturbance of temporomandibular origin. J.A.D.A. & D. Cosmos 25:1390 Sept. 1938.

28. Brader, Allen C. The application of the principles of cephalometric laminagraphy to studies of the frontal planes of the human head. Am. J. Orthodont. 35:249 April 1949.

29. Ricketts, R. M. Variations of the temporomandibular joint as revealed by cephalometric laminagraphy. Am. J. Orthodont. 36:877 Dec. 1950.

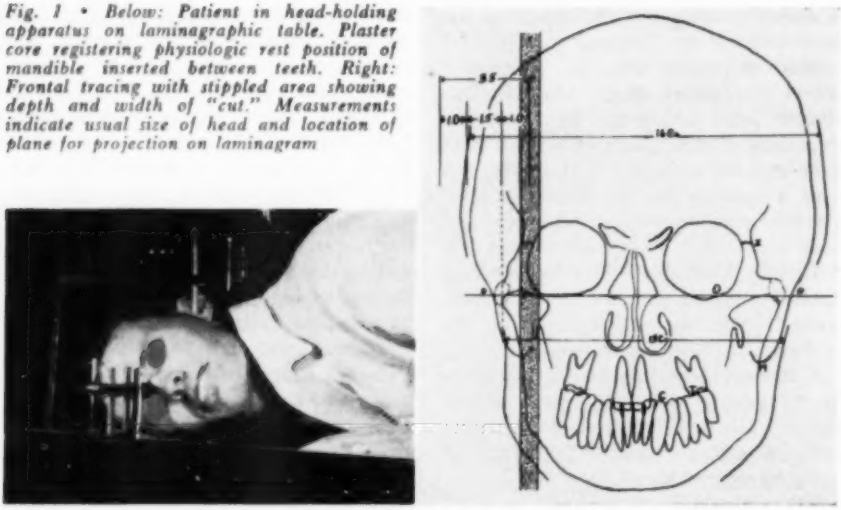


Fig. 1 • Below: Patient in head-holding apparatus on laminagraphic table. Plaster core registering physiologic rest position of mandible inserted between teeth. Right: Frontal tracing with stippled area showing depth and width of "cut." Measurements indicate usual size of head and location of plane for projection on laminagram

this "cut" was approximately .5 to .75 cm. (Fig. 1, right). All the structures required for the projected study could be visualized in such laminagrams and could be traced as shown in Figure 2. Since the head was stabilized, tracings superimposed on cranial planes revealed the changes in mandibular and condylar positions during function.

Laminagrams of the temporomandibular articulations of nearly 400 different individuals have been studied during the past four years. This sample group is composed of individuals at various age

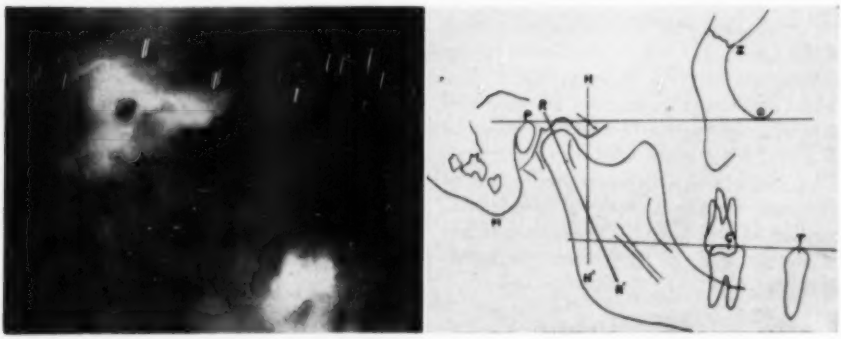


Fig. 2 • Laminagram and tracing showing points and planes of reference: M, mastoid process; P, porion; O, orbitale; Z, zygomaticofrontal suture; C, centrobuccal cusp of lower first molar; T, tip of lower cuspid; PO, Frankfort plane; HH', perpendicular through PO at height of eminence; CT, occlusal plane; RR', plane parallel to long axis of neck of condyle

levels with normal occlusion, with malocclusion and with a wide variety of temporomandibular joint disorders. At each examination both joints were viewed in occlusion, in rest position and in wide-open mouth position. In many instances, follow-up records were made for the purpose of growth studies and for the evaluation of therapeutic procedures.

NORMAL RANGE OF VARIATION IN TEMPOROMANDIBULAR JOINT

A control group was studied first for the purpose of determining the normal range of variation. This group consisted of 50 individuals with essentially normal occlusion. In addition, 50 patients with Class II malocclusions and 15 patients with Class III malocclusions were studied. None of these patients exhibited clinical manifestations of joint disturbance. The ranges of variation found in the 50 patients with satisfactory occlusions are taken as the basis for comparison of individual pathologic conditions.

The anatomy of the fossa may be discussed in terms of the angle of the eminence, the height of the eminence (depth of fossa) and the relation of the fossa to the Frankfort horizontal plane.[30] Little difference could be noted between the joints of the control group and those of the group with Class II malocclusions. The angle of the eminence, its height and its relation to the Frankfort plane also showed little difference. Substantial differences, however, were noted in the joints of patients with Class III malocclusions. The joints of these patients usually demonstrated flatter and shorter eminences associated with a fossa positioned well above the external auditory meatus (Fig. 3).

The condyle positions in various states of function were then studied. It was found that the wide-open position might range from 5 mm. anterior to .5 mm. posterior to the summit of the eminence (Fig. 4). The typical condylar location in this position was found to be slightly anterior to the summit of the eminence. Little difference was noted in the various samples studied, although the forward movement did not seem to be extensive in the Class III cases.

Different types of joint behavior were noted during the opening movement. The early phase of opening was accompanied by a forward translation of the condyle in many cases. In others no forward movement of the condyle was observed during this phase (Fig. 5). Rotary behavior was usually associated with skeletal patterns of patients with Class III

30. Angel, J. L. Factors in temporomandibular joint form. Am. J. Anat. 83:223 Sept. 1948.

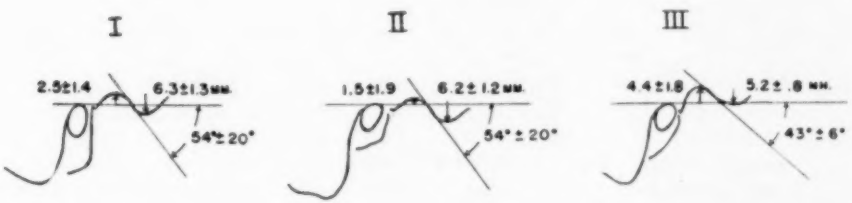


Fig. 3 • Morphological variation of fossae, including angle of eminence, height of eminence and relation of fossa to Frankfort plane. I: Means and two-thirds distribution of both joints of a cross sectional group of 50 patients. II: Findings in 50 cases of Class II malocclusions. III: Means and standard deviations of 15 cases of Class III malocclusions. Note high position of fossa in Class III and low standard deviation of angle of eminence

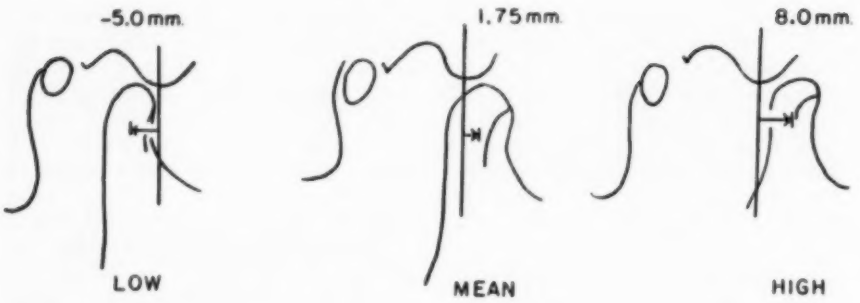


Fig. 4 • Range of variation in position of condyle with mouth wide-open. Note in center diagram that in forced opening of mouth average condyle is slightly anterior to summit of eminence. Note in diagram on right that condyle is entirely anterior to eminence. This position represents extreme of forward movement in sample of 100 normal conditions. Note further that in some instances condyle does not reach summit of eminence (diagram on left)

malocclusions, although a wide variation existed in all types.

In the control group, 85 per cent of the cases registered no appreciable condylar movement from rest to closure, while 15 per cent moved 1.5 to 2 mm. In the Class II cases, 68 per cent registered movement from 2 to 7 mm. during this function. The condyle position as the teeth were clenched was the same in both samples. The average condyle position was well centered at rest position in the control group but was usually in a downward and forward position in the Class II group (Fig. 6). The condyles of the Class III group showed opposite behavior to

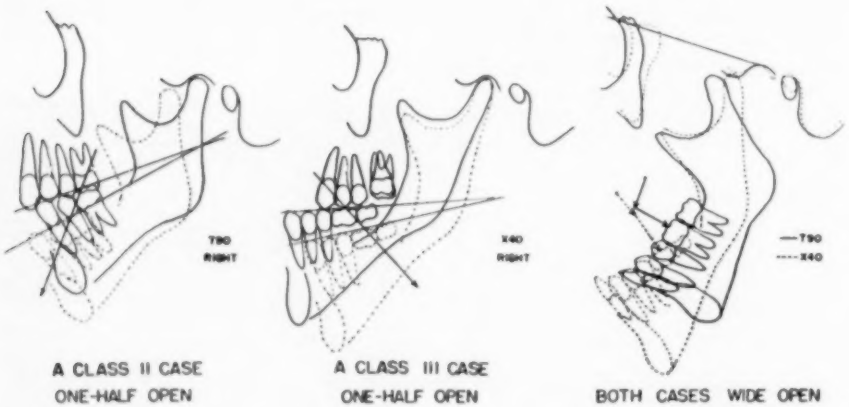


Fig. 5 • Patterns during opening movement. Condyle in case T90 (Class II) comes forward in early phase of opening. No translation can be observed in case X40 (Class III) during this phase. Differences can be observed in extent of forward movement and in path of opening when tracings are superimposed on fossa and zygomaticofrontal suture plane. This phenomenon is characteristic of but not definitely associated with these particular skeletal patterns

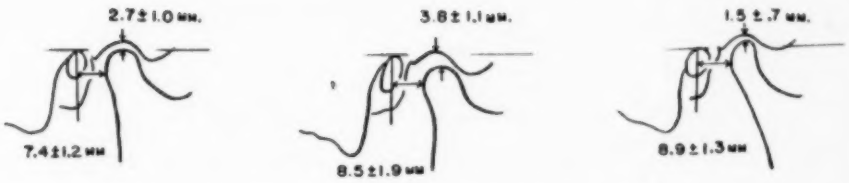


Fig. 6 • Condylar rest position means and standard deviations. Note in control series (left) that condyle is well centered in fossa. In Class II (center) average condyle is downward and forward compared with that of control group. In Class III (right) average condyle is long, thin and positioned high in fossa

that of the Class II group; they tended to be positioned high in the cavity both at rest and in occlusion.

The mandibular teeth were studied next. Attention was directed to their relation to the maxillary teeth at the rest position and to the path followed in closing the jaws. These relations were correlated with the morphology of the individual joints. It was found that the Class II cases tended to have a more vertical path of closure, a wider interocclusal dimension in the molar region and a greater rotation than the control group. Class III cases tended to have a still wider interocclusal dimension and rotation but a path of closure that was more forward than that of the control group (Fig. 7).

Statistical evaluation of the pertinent data of joint and denture relationships is shown in the table. In applying these data for analysis, one should keep in mind that no single measurement is diagnostic. Interpretation depends on the correlation of one value with another. For example, a distal path of closure does not necessarily mean a malplacement of the condyle beyond its normal closed position unless combined with a condyle resting position toward the extreme end of the range.

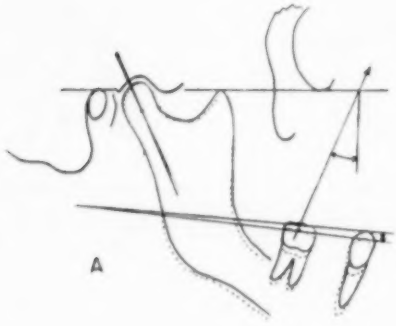
All the possible combinations of integral parts in the analysis cannot be enumerated; but details permitting the comparison of individual temporomandibular joints have been established. The reliability of the method has been demonstrated in a large number of clinical cases.

DISTURBANCES OF THE TEMPOROMANDIBULAR JOINT

Disturbances in any part of the masticatory mechanism may affect the temporomandibular articulation. Therefore, it is necessary to employ methods of examination and study which include the teeth, the jaws and the muscles in the diagnosis of involvement of this articulation. The purpose of this paper is to demonstrate the usefulness of cephalometric laminagraphy when combined with conventional methods of analysis in the diagnosis of temporomandibular joint problems.

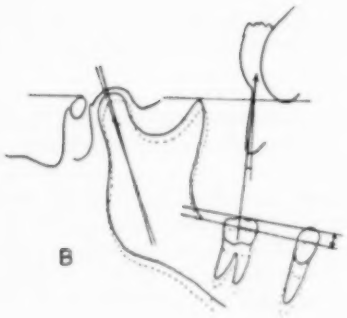
The five cases selected for this paper were chosen from a sample of 190 cases of disturbances of the temporomandibular articulation because each represents a particular type of malfunction. The principles which underlie the analysis of the five cases are applicable to the joint problems most commonly encountered in clinical experience.

A detailed history of the dental experience of each patient was recorded. It included a history of the type, location and duration of pain. Opening, closing, protrusive and excursive movements of the mandible were studied as were all



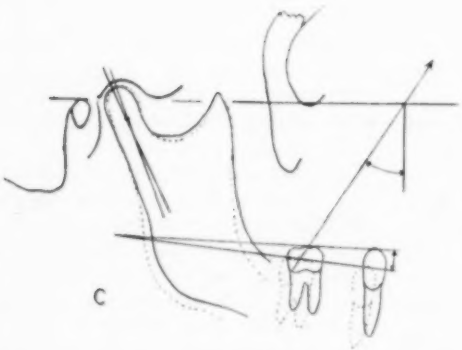
CLASS I

IDM	1.8 ±	.9 MM
ADO	1.6 ±	.9°
PC	22 (112°) ±	21°



CLASS II

IDM	3.6 ±	1.5 MM
ADO	2.7 ±	1.6°
PC	5 (95°) ±	24°



CLASS III

IDM	4.3 ±	2.4 MM
ADO	3.6 ±	1.3°
PC	35 (125°) ±	10°

Fig. 7 • Denture relationships of the three groups: control, Class II sample and Class III sample. Note that interocclusal dimension of molars (IDM) is progressively wider with greater variation as distance increases. Angle formed by rotation of occlusal plane (ADO) likewise increases, but variation is less in Class III sample than in Class II sample. Note that average path of closure (PC) is almost vertical in Class II sample and more forward in Class III sample than in control. Note also that the (PC) variation is lowest in Class III sample and almost too wide to be of any analytical significance in the control and Class II sample

Table • Standards for laminagraphic analysis*

	Means	Standard deviations	Ranges	
			Low	High
Condyle-fossa relationship				
Movement from rest to closure	0.5 mm.		0	2.0 mm.
Condylar-eminential dimension in occlusion	1.5 mm.	± .5 mm.	0.5 mm.	3.0 mm.
Supracondylar dimension in occlusion	2.5 mm.	±1.0 mm.	0.5 mm.	5.5 mm.
Condylar-meatal dimension in occlusion	7.5 mm.	±1.5 mm.	5.0 mm.	10.0 mm.
Denture relationship				
Cant of occlusal plane	7.5°(97.5°)	±5.5°	−6°	+16°
Interocclusal dimension at first molars	2.0 mm.	±1.0 mm.	.5 mm.	4.5 mm.
Angle of divergence of occlusal plane	1.5°	±1.0°	0	+4.5°
Path of closure	22°(112°)	±21°	−26°	+60°

*Analytical criteria for control cases to be used for comparison with individual case. Upper figures are those of joint relationships; lower figures are those of denture relationships. Analysis by application of these standards necessitates an interpretation of combinations of these measurements.

deviations in swallowing, speaking and chewing. The joints and muscles of mastication were palpated in function. In the digital examination the examiner placed a finger in front of the tragus of the ear and requested the patient to perform movements. Painful pressure points were elicited in some cases. This procedure was repeated with the finger in and around the ear canals. A stethoscope was found to be useful in determining crepitation or clicking in the joints.

After the clinical examination, plaster models were prepared for detailed analysis. Critical points in the analysis of the models were arch relationships, symmetry, individual tooth position and evidences of attritional patterns in the dentition. Frontal and profile photographs were taken for the purpose of studying symmetry or lack of harmony and balance.

In isolated cases electromyograms were obtained in order to determine aberrant muscular patterns during function. The muscles of mastication and the hyoid musculature were the structural groups thus examined.

The roentgenographic records consisted of cephalometric laminagrams of both temporomandibular joints, full mouth intraoral roentgenograms and cephalometric headplates. The intraoral roentgenograms were checked for pulp or periodontal involvement and possible sources of disease. Conditions of the supporting bone were noted. The cephalometric headplates were examined for important structures visible therein; namely, sinuses, vertebrae, hyoid bone position and airway space. An attempt was made to identify the skeletal pattern types.[31]

By far the greatest single diagnostic aid in the examination of these cases was the laminagraphic analysis of the temporomandibular joints. In all cases laminagrams were taken with the teeth in occlusion, with the mandible at rest and with the mouth wide-open. In many instances excursions were studied in order to determine functional patterns.

Case 1: Deleterious Effects of an Improper Partial Denture •

Records • The patient was a 35 year old woman whose chief complaint was pain in the left temporomandibular joint. The first episode of pain had occurred five years previously, at which time temporary relief was obtained with an injection of Xylocaine into the joint. Return of the pain occurred when the patient attempted to open her mouth wide or when she talked for a long period. Nothing significant was noted in the functional analysis except that the limit of protru-

31. Downs, W. B. Variations in facial relationship: their significance in treatment and prognosis. Am. J. Orthodont. 34:812 Oct. 1948.

sion of the mandible was at a position of end-to-end contact of the incisors. It was also noticed that the mandible displayed unusual forward and backward activity during speech. During acute attacks the patient was unable to open her mouth because of contracture states of the muscles.

A photograph at 18 years of age showed an esthetic face with no spacing of the front teeth, whereas a later photograph revealed diastemas and poor muscle balance (Fig. 8). The patient covered the teeth with the lips unless told to occlude her teeth.

The intraoral roentgenograms revealed bone density consistent with the patient's age and general health. Several areas of calculus formation could be seen around the lower teeth. Numerous alveolar crests were indistinct and flattened.

Wide spacing and protrusion of the maxillary incisors together with a deep overbite were seen in the models (Fig. 9, above). The midline of the maxillary arch was definitely to the right of that of the mandibular arch. A tracing of the lateral headplate revealed a well balanced mesognathic skeletal pattern. The disharmony in the pattern was limited to

Fig. 8 • Case P124. Above center: At age 18, normal contact of upper anterior teeth. Below left: At age 35, spaces have developed and lips are drawn and tense. Below center: At natural pose, patient has concealed malocclusion. Below right: In full occlusion, upper anterior teeth protrude between lips

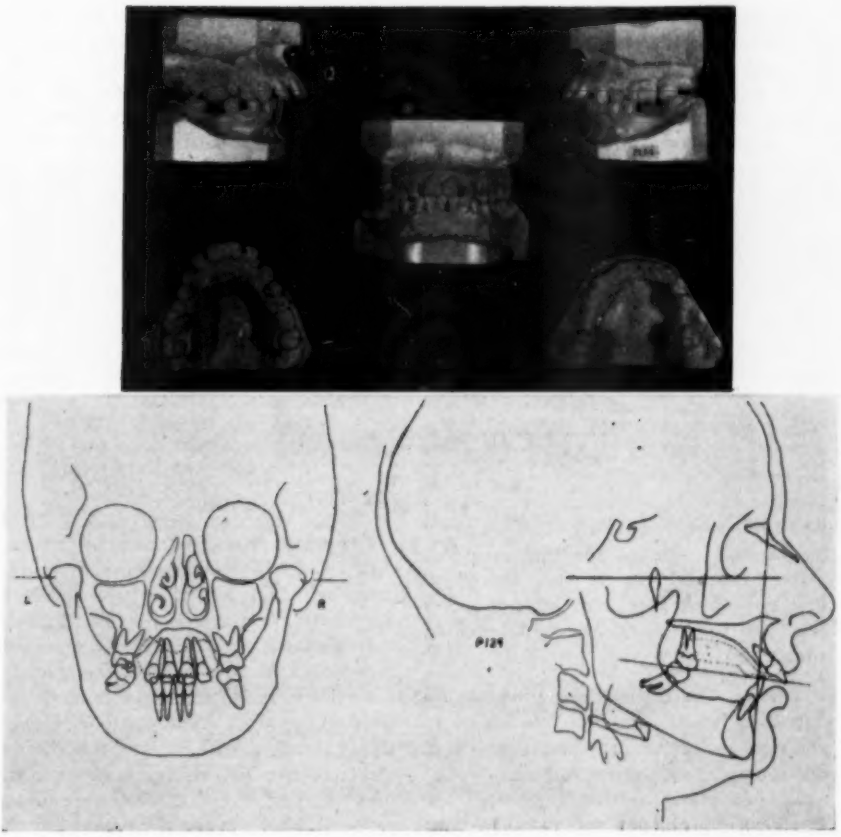


Fig. 9 • Case P124. Above: Note Class II Division 1 tooth relationship with upper palatal type partial denture in place. Note deep overbite and spacing of teeth. Below: Headplate tracings. Note that lower midline is to the left and there is disharmony of upper anterior teeth to rest of skeletal and denture pattern

the upper anterior segment of teeth (Fig. 9, below).

In the laminagrams the condyle and fossa of the right joint were seen to be smooth and well contoured (Fig. 10). The condyle in occlusion was found in a distal, superior position in the fossa. At rest, the condyle was positioned 4 mm. downward and forward from this position, and the interocclusal dimension was 4 mm. at the molar. The path of closure was upward and backward 30 degrees.

The left condyle and fossa were smooth; however, there was a suggestion of sclerotic change in the articulating surfaces of the condyle and the eminence. Condyle behavior of the left side was similar to that of the right side. The interocclusal dimension was 3.5 mm. in the molar region, and the path of closure was upward and backward 10 degrees (Fig. 10).

Discussion of Clinical Findings • Starting with a slight maxillary tooth protrusion and the loss of some of the molar teeth, a deleterious change in the masticatory mechanism developed. A palatal type of partial denture, which had been in place for ten years, caused pressures in an upward and forward direction against the upper incisors when the patient occluded. Without posterior occlusion the anterior teeth were more frequently under tension in the labial direction, and in seven years they had protruded to the extent that the lower lip was caught beneath them. Further protrusion of the teeth developed with the added impetus of the lip pressure.

Pain was noticed first when the patient attempted to bite a sandwich. It is possible that the ligaments of the joint had been stretched and injured because of extreme traumatic function in a forward position. From the time that these first symptoms appeared, nothing other than the function of speech aggravated the condition.

Biologic Correlations • A direct application of Wolff's law was evidenced in the reaction of the alveolar process. Both the intraoral roentgenogram and the lateral films indicated that the upper anterior teeth were well supported by bone and that this bone was of good trabecular arrangement and density. Bone in this instance had responded to forces of adequate intensity and duration by adapting itself to a new position of the teeth. This adaptation had occurred in spite of the age of the patient and a systemic condition suggestive of nutritional deficiency and endocrine disturbances. This result indicates that good bone formation is not a guarantee against deformity under the stress of abnormal muscular force. Muscle is less adaptive than bone; however, certain changes in muscle are implicit as a result of the changes in other structures. Functional variations registered in the headplates and laminagrams suggested changes in the musculature. The deformity was much worse in occlusion than at physiologic rest position. At rest the patient instinctively attempted to minimize the deformity by assuming a more forward position which resulted in better muscular balance. It was thought that this accommodation was brought about by a reflex phenomenon.

The records indicated that the condyle was at its forward limit during incision. This incisal position might have acted as a limiting factor in the deformity. In the roentgenograms early degenerative changes in the left joint were evidenced by the sclerosis of bone at the articular areas. Although the patient's history disclosed numerous episodes of disturbance, no gross changes in the contour of the joint surfaces were detectable.

Diagnosis and Treatment • In this case a Class II malocclusion was complicated by missing posterior teeth and early degenerative changes of the left temporomandibular joint. Although the mandible had a distal path of closure, the condyles were not retruded in occlusion; and they were forward at rest position. Hence, this was not a case of true mandibular displacement. The abnormal range in the protrusion of the mandible necessitated excessive and abnormal function of the condyle as evidenced by the fact that only speech gave rise to joint discomfort. The lack of posterior teeth may have been a contributing factor.

The deep overbite, the displaced cuspids and the general health of the tissues were contraindications for the removal of the teeth and prosthetic replacement. Proper treatment required (1) orthodontic management for the retraction of the incisors and the reduction of the strain on the joint and (2) replacement of the missing teeth by a prosthesis which would permit the muscles to return to their natural functions.

Proof of the correctness of the analysis and justification for the treatment plan

were borne out by the clinical management. As the upper teeth were retracted, incision was brought within a more normal range; and the mandibular rest position drifted distally (Fig. 11). Little or no discomfort was experienced in the joint, and pain no longer resulted from the activity of the mandible during conversa-

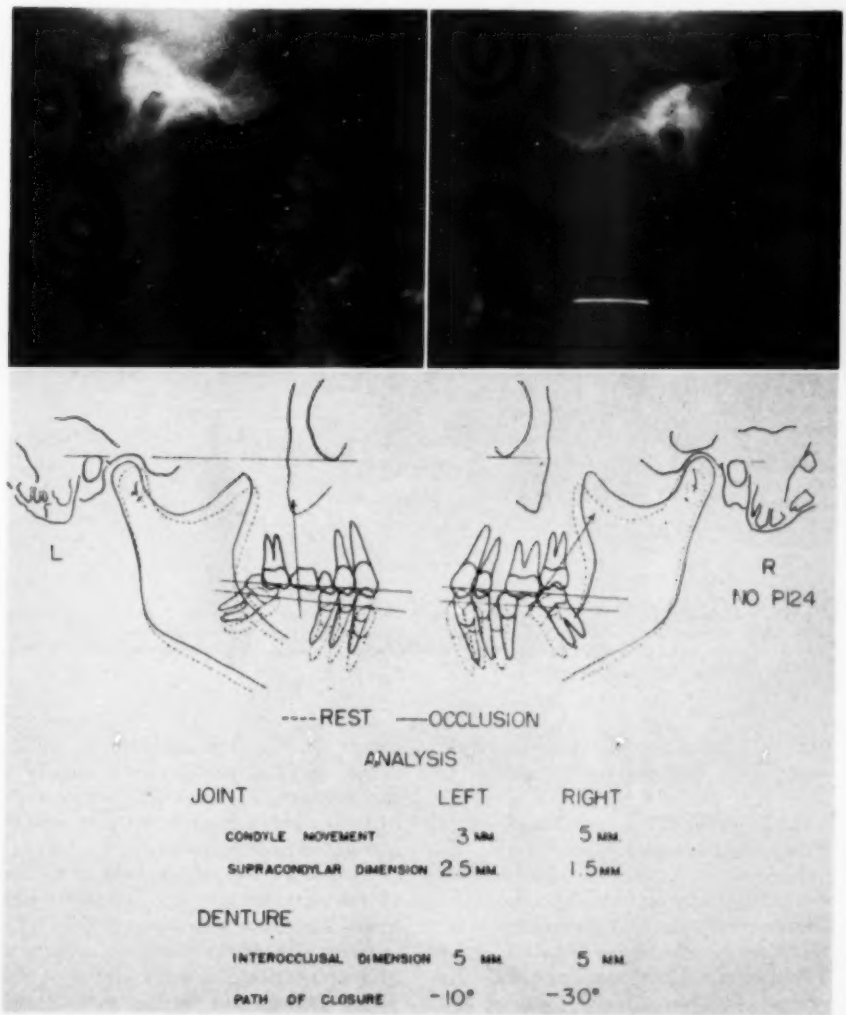


Fig. 10 • Laminagrams of Case P124. Note sclerotic changes in left condyle although its position is well centered in the fossa. Right condyle is normal. Analysis reveals distal path of closure caused by forward position of mandible at physiologic rest position. Compare figures with standards in the table

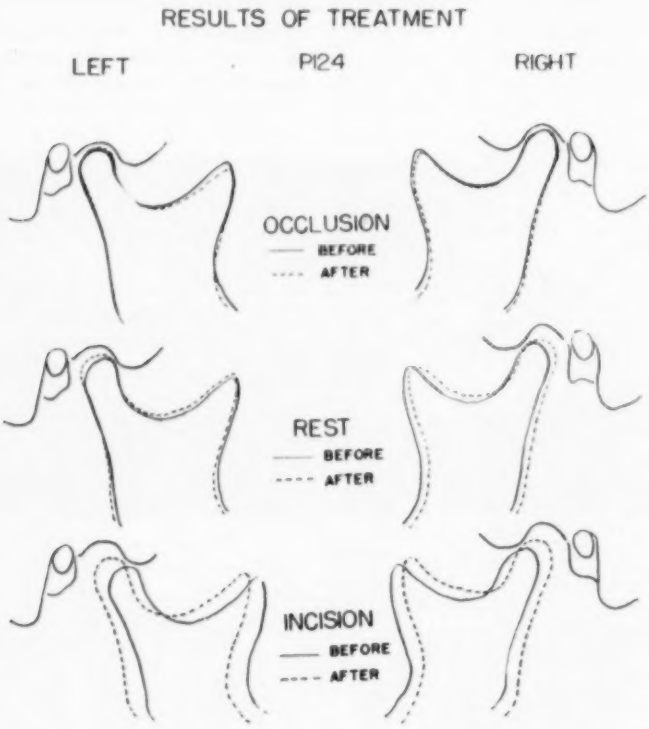


Fig. 11 • Case P124: tracings of laminagrams before and after treatment. Note lack of change in condyle position in occlusion but upward and backward change at rest position. After retraction of incisors condyle moves forward for incision approximately one-half the distance required for this function before treatment

tion, in spite of the fact that the missing lower teeth had not yet been replaced.

Case 2: Influence of the Teeth on the Temporomandibular Joint •

Records • A 34 year old housewife complained of pain in both temporomandibular joints. She had experienced severe pain four months previously after a yawn. The discomfort had eased to a dull ache, which increased after a meal of hard foods. Both joints were crepitant, and the condyles were well retruded in the fossae. The right joint was painful on palpation. Opening and protrusive movements were limited to half the normal range, and the jaw deviated slightly to the right on opening. The upper right first bicuspid was in traumatic relation in right lateral excursion.

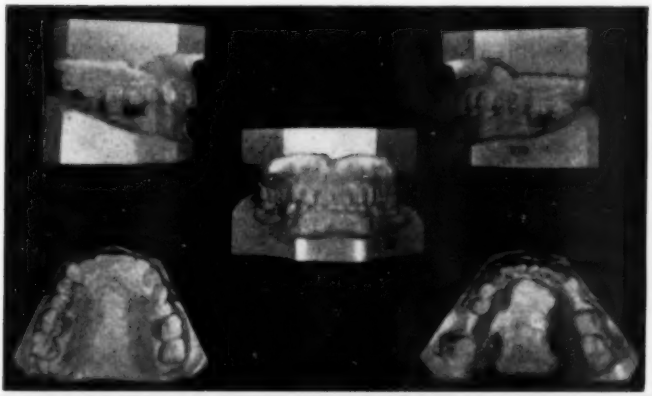
Analysis of the models indicated Class II jaw relationship with a square arch form. The teeth were crowded, and the overbite was deep. Facets of wear were evident on the lingual surfaces of the upper incisors and on the occlusal surfaces of the second molar (Fig. 12, above).

The frontal headplate revealed a symmetrical facial skeleton with both den-

ture midlines slightly to the left. The lateral headplate revealed a balanced and harmonious mesognathic face with slightly retruded incisors in both arches (Fig. 12, below).

Laminagrams of the left joint revealed a small condyle of normal form. At rest, the condyle was well centered in the fossa but moved 3 mm. upward and backward as the teeth were brought into occlusion. In this position a condylar-meatal measurement of 5 mm. and a condylar-eminential dimension of 4 mm. suggested a distal displacement of the condyle. The interocclusal dimension was 3 mm., and the path of closure was −23 degrees. Movement of the condyle was limited in opening.

Laminagrams of the right side suggested degenerative changes. The anterior condylar border was indistinct, and slight sclerotic changes were evident within the spongiosa of the condyle. Functional behavior of the right side was almost identical with that of the left side except for a more direct distal positioning in the occluded position (Fig. 13).



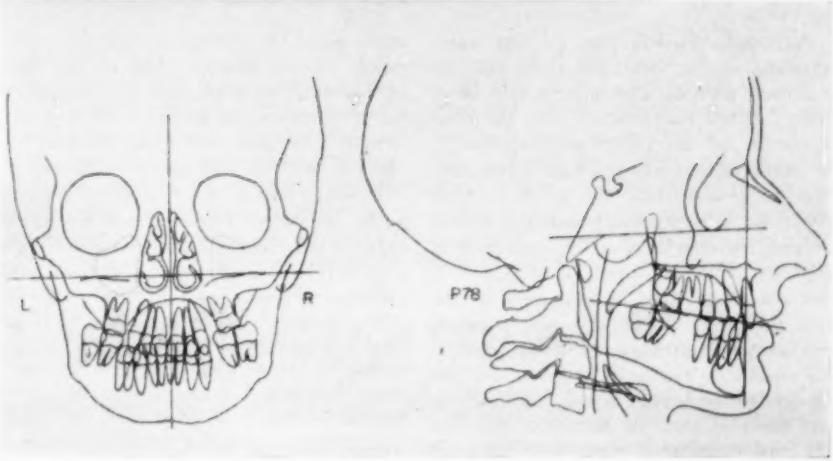


Fig. 12 • Case P78. Left: Note Class II Division 2 relation, deep overbite and missing teeth. Below: Frontal and lateral headplate tracings. Maxillary and mandibular midlines are to the left. Note retrusion of maxillary and mandibular incisors

Analysis of Findings • In order to understand the chain of events that gave rise to the symptoms in this case it is necessary to recall the findings derived from the control study. In this case a Class II Division 2 malocclusion was characterized by a retrusion of the maxillary incisors in contrast to the Class II Division 1 malocclusion which was described in the first case and which was characterized by protrusion of those teeth. The first case exhibited a temporomandibular joint morphology and function characteristic of the Class II group; that is, the condyle was downward and forward at rest but at a normal position in occlusion. In the present case the condyle was in a correct position when the jaws were at rest but was thrust upward and backward when the teeth were clenched.

It was impossible to determine what the path of closure from rest to occlusion had been before the extraction of the posterior teeth, but it was assumed that it more closely approximated an upward and forward rotation. The loss of the posterior teeth permitted the jaws to overclose with the result that the lingual surfaces of the maxillary incisors became the determinants of further jaw movement, which had to be in an upward and backward direction.

Although the left condyle was more retruded in the fossa, the right condyle was more painful. The left condyle, however, did not lose contact with the eminence as did the right condyle; that is, its juxtaposition was not lost. This situation suggested that the right condyle might be in traumatic relation as it was carried forward against the eminence in function. The retruded position *per se* did not seem to be as important as the fact that the condyle did not maintain contact with the eminence in this particular instance. The soft tissues could not be seen directly, but it was assumed on the basis of condyle behavior that the clicking occurred as the condyle traveled distally around the bulbous portion of the disk in full closure of the teeth.

Biologic Correlations • As a result of tooth and muscular conditions the condyle was displaced posteriorly. Under prolonged stretching, changes occurred in the ligamentous structures so that they no longer displayed their former stress resistance.

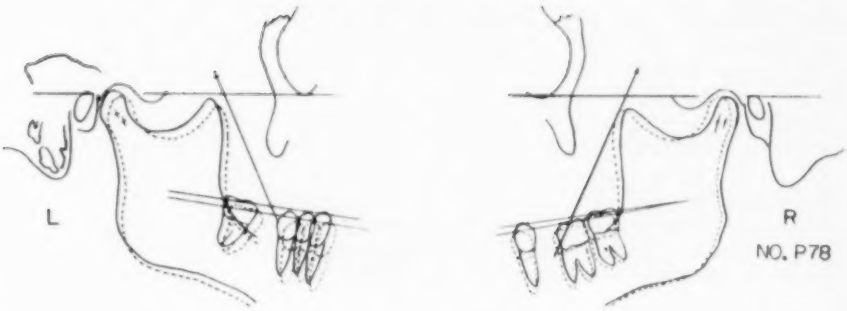
The history of injury in yawning suggested that the disk, together with the articular surfaces, had been injured; this injury was probably due to the effects of long-continued abuse. Irregular contour of the right condyle also suggested pathologic changes which were advanced to a state where the condition was irreversible.

The case presented a dilemma, for while the surrounding structures, that is, the ligaments, the capsule and the muscles, required function, the joint cartilage required rest and particularly freedom from pressure in order to reach its optimal regeneration.[32]

Diagnosis and Treatment • The primary etiological factor was thought to be true distal displacement of the mandible. The condyles according to the analysis had an acceptably normal position at rest but a retruded position in occlusion. The resulting changes elsewhere were a manifestation of the malocclusion. The object of the treatment was, therefore, to provide rest for the articular surfaces and gentle exercise for the ligamentous and muscle tissues.

A splint for the lower denture seemed to be indicated. It was thought that by this means the mandible would be directed forward and would be prevented from overclosing, so that the ligaments could operate within normal range and thus recuperate. The cuspid areas were

32. Steindler, A. Notes from Midwest Dental Medicine Seminar, 1950.



----REST —OCCLUSION

ANALYSIS

JOINT	LEFT	RIGHT
CONDYLE MOVEMENT	3MM.	2.5MM.
CONDYLAR-EMINENTIAL DIMENSION	4MM.	3.5MM.
SUPRACONDYLAR DIMENSION	2MM.	3MM.
CONDYLAR-MEATAL DIMENSION	5MM.	6MM.
DENTURE		
INTEROCCLUSAL DIMENSION	3MM.	2MM.
PATH OF CLOSURE	-23°	-24°

Fig. 13 • True distal malplacement. Laminagraphic analysis of Case P78 indicated normal relation of condyle at rest, distal path of closure and distal displacement of condyle in occlusion. Compare this case with Case P124 and figures with data in the table

to be built up on the splint to assure smooth lateral excursions and thus induce a return to a more normal pattern of muscle function. Experience with the splint would be the basis for subsequent permanent rehabilitation procedures such as functional grinding and the placement of overlays.

A splint incorporating the above considerations was constructed and placed over the occlusal surfaces of the lower teeth, and the patient had complete relief from the joint pain in a period of two weeks (Fig. 14). After a period of adjustment, during which time there was no recurrence of symptoms, the splint was replaced by a chrome alloy appliance which replaced the missing teeth and covered certain others. One year after the placing of this appliance the patient had had no recurrence of symptoms.

Case 3: The Interdependence of Teeth, Muscle and Bone •

Records • A 30 year old female had an open bite with a retruding appearance of the chin and occasional snapping of the

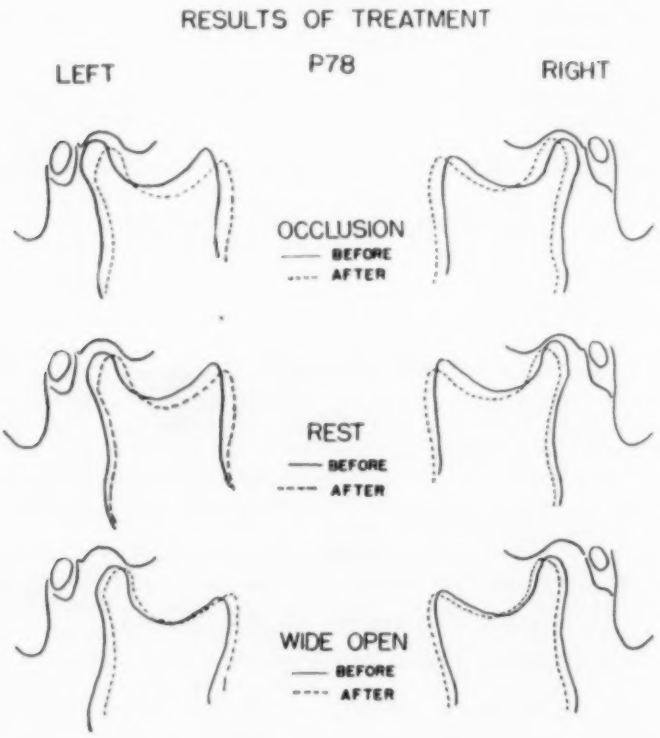


Fig. 14 • Treatment changes revealed by laminagraphic tracings of Case P78. Note that condyle was positioned forward in occlusion and that rest position also was forward after treatment. Patient had wider range in opening after treatment

jaw. She was unable to incise, although until the lower third molars erupted she had been able to bite a thread in two with her incisors.

The mouth could be opened to full range with no deviation of the midline. A loud click was discernible in both articulations, but neither joint was painful. In protrusive and excursive movements, the lower third molars struck the upper second molars.

The models revealed a Class II malocclusion with symmetrical arches, open bite, wide overjet and lapped anterior teeth (Fig. 15, above). The lower second and third molars were tipped forward as a result of the loss of the first molars, and their cusps showed flat facets of wear.

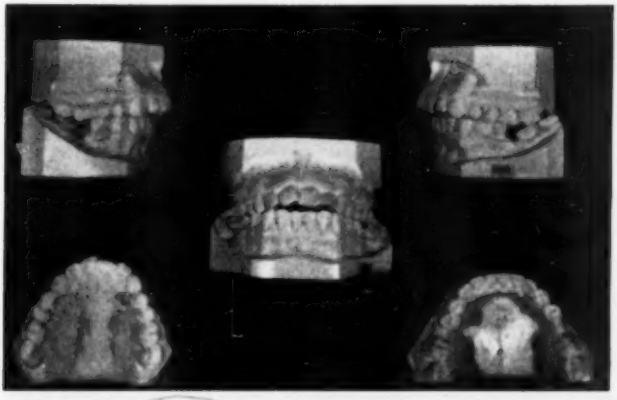
The headplate tracings revealed the maxilla forward with the upper denture slightly protrusive. The tongue lay between the upper and lower anterior teeth, and a dimpling of the chin indicated a mentalis muscle habit. The hyoid bone was at a lower line than is commonly seen (Fig. 15, below).

The roentgenogram of the left temporomandibular joint indicated definite degenerative changes. Lipping, or exos-

tosis, could be seen at the articular surfaces of the condyle and the eminence. The condyle moved 3 mm. upward and backward from rest to closure. The movement suggested that the clicking occurred as the condyle moved past the summit of the eminence, but the condyle position in opening was within normal range. The right joint showed essentially the same but more extensive pathologic involvement (Fig. 16).

Analysis of Findings • A tongue-thrusting and mentalis habit developed at an early age, which in the typical skeletal pattern of a patient with a Class II malocclusion seemed to be the etiological factor in the production of the open-bite Class II malocclusion.

The loss of the lower first molars had permitted the second molars to tip forward. The upper third molars had been removed because of caries, and the lower



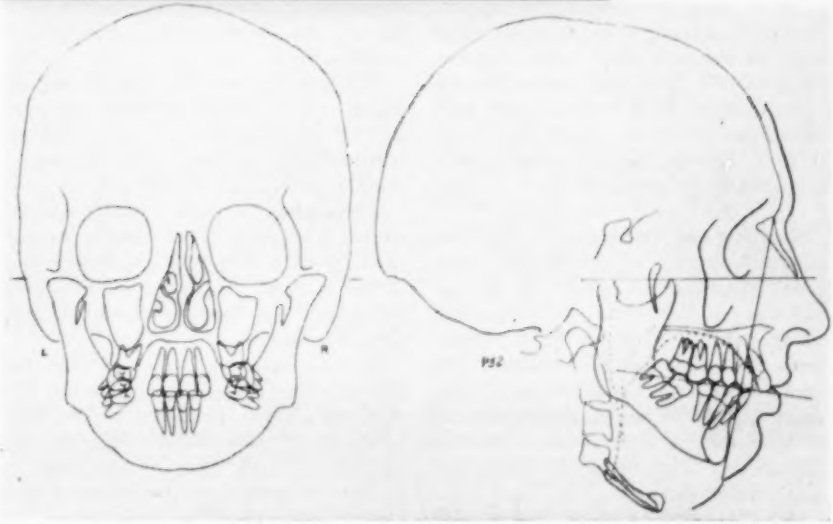


Fig. 15 • Case P32. Left: Note Class II open-bite relation with forward inclination and supra-erupted position of lower third molars. Below: Headplate tracings. Midline of lower dental arch is to the left. Note retrognathic convex type facial pattern, overjet of teeth, low hyoid bone, and tongue thrust between front teeth

third molars had overerupted and tipped forward. By these shiftings of the teeth, the entire pattern of jaw movements had been altered. In all movements necessitating protrusion of the mandible, the lower third molars interfered with the upper second molars, making normal incisal contact impossible. In lateral movements this interference occurred on the nonworking side. A situation of imbalance of the teeth, muscle and joint was established which made it impossible for the joint to disarticulate the posterior teeth in normal movements.

Biologic Correlations • In this case the adaptive changes that occurred in the articulating bodies of the joint allowed further analysis of bone reaction. The actual causes of these changes are debatable. The first possibility is that the joint was under increased tension since more power was needed to overcome interference when the jaw was brought forward. Secondly, the condyle might have drawn away from the eminence to an excessive degree as a result of the molars' acting as a fulcrum. The third possibility is an interference with the circulation of the joint. The distal thrusting of the condyle has been thought to affect the blood supply of the joint since a rich vascular bed is located posteriorly and superiorly to the condyle. It is doubtful that such obstruction could be maintained long, however, for bone under constant pressure tends to be resorbed.

Diagnosis and Treatment • This case presented a state of interference with normal masticatory activity. As the patient was an adult, the muscular pattern was thought to be firmly fixed. Orthodontic correction therefore was not indicated. Since the condition had been caused largely by the supra-eruption of the third molars, their removal together with the replacement of the lower first molars was indicated.

After the removal of the lower third molars immediate improvement in the esthetic appearance of the face was observed. The patient could incise with little difficulty and expressed a sense of well-being in regard to her occlusion.

Case 4: Effects of Malocclusion in Advanced Age •

Records • A 61 year old housewife complained of pain in the left temporomandibular joint, inability to chew and difficulty in opening her mouth. She gave a history of muscular cramps in the jaws for a period of more than 10 years. All other joints were without symptoms.

Four months prior to the examination the patient had experienced a violent pain in the right temporomandibular joint while yawning. Examination with the stethoscope revealed an extremely dry, crepitous right joint. The patient chewed on the left side because of pain when chewing on the right side. The mandibular midline was to the left of the maxillary midline, and the occlusal plane was tilted down on the right side. The mandible deviated to the right in closing from the rest position. Opening and protrusive movements were limited. It was impossible to determine lateral functions because the patient had no definite occlusal pattern.

The models showed a Class II jaw relation with a deep overbite, excessive overjet, crowded lower incisors and an upper partial denture replacing several missing teeth (Fig. 17, above).

The cephalometric headplates demonstrated a straight profile and a mesognathic pattern. The main disharmony was in the incisors; the upper incisors were protruded, the lower incisors retruded (Fig. 17, below).

The laminagrams indicated that the left joint was normal except for the fact that the condyle remained in the fossa as the mouth was opened (Fig. 18). On the right side the condyle was found to be forward both at rest position and with the teeth together. The articulating sur-

face of the condyle and of the eminence showed evidence of spurring and lipping. As the mouth was opened, the condyle approximated the eminence. An eroded area was observed at the posterior superior border of the condyle. The neck of the right condyle was 4 mm. shorter than the left.

Analysis of Findings • This patient probably always had had a Class II malocclusion; however, the loss of some teeth and the drifting of others with the subsequent loss of proper function led to a more severe condition. The relations of the teeth resulted in greater demands on the joint and contributed to its breakdown. Changes in the muscles of mastication, the teeth and the joint led to an entire disorientation of functional occlusion.

In the roentgenogram the right joint showed advanced degenerative changes. It is significant to note that in this case the condyle was in a forward position. Although this condition would lead to the suspicion that distal displacement of the condyle was present, the opposite was

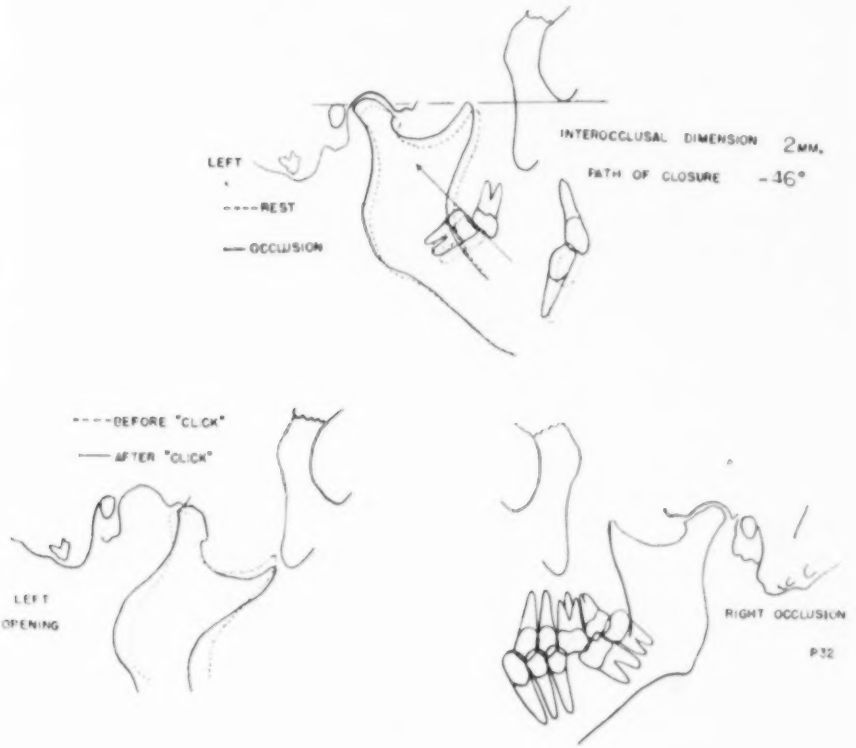


Fig. 16 • Laminagraphic tracings of Case P32, indicating distal path of closure directed along occlusal surface of lower third molar. Note abnormal appearance of joint. Clicking occurs in wide opening (lower left) although condyle position is within normal range. Right condyle seems to show greater changes (lower right). Compare joint and occlusal relation in laminagram to overjet in headplate to visualize interference in functional movements.

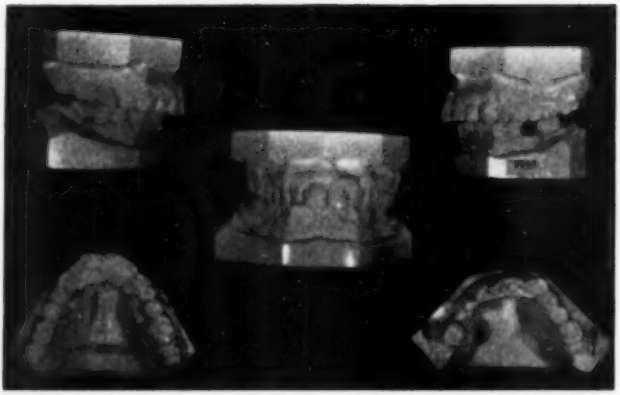
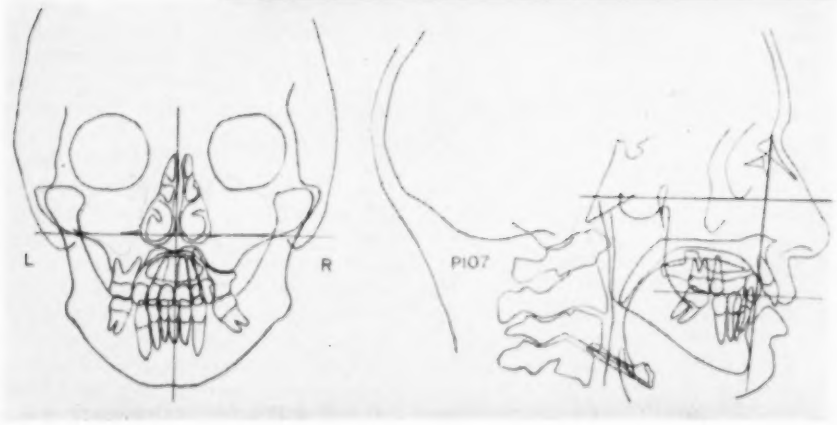


Fig. 17 • Case P107. Right: Note Class II Division 1 relation, deep overbite and extreme overjet, upper partial denture and crowding of lower anterior teeth. Below: Headplate tracings. Midline of lower dental arch is to the left. Note slight protrusion of upper anterior teeth but definite retrusion of lower anterior teeth



true. It did not appear that stretching of the ligaments by functional interference had been significant in this case. Apparently there was forward thrusting of the mandible coupled with loss of posterior tooth support. It is possible that these factors provided enough trauma to exceed the physiologic tolerance of the joint and therefore contributed to its degeneration.

Biologic Correlations • The inability of the patient to chew probably contributed to the joint and muscular problems. The loss of normal reflex activity led to imbalance and dysfunction in the musculature and helped to produce the pathologic condition.

Because of the age of the patient and the lack of knowledge concerning systemic conditions, it was not possible to determine whether the primary cause was trauma to the joint; but it was definitely a contributing factor. Although the initial breakdown of a joint usually consists of fraying and fibrillation of the cartilage, it was assumed from the roentgenogram that this tissue had almost entirely disappeared. Erosions and spurring of bone were evident on both articular surfaces,

and the space between the surfaces was unusually narrow.

In this patient, limited motion in the joint for more than ten years had affected the musculature. Originally the limitations were imposed by a protective spastic contracture. Changes had occurred within the muscle as a result of prolonged hyperinnervation as the muscle adapted itself to the decreased range of motion. Such changes are usually fibrous replacements of the healthy muscle fibers and occur as a result of a natural physiologic process.

Diagnosis and Treatment • Since this was a case of a Class II malocclusion with indefinite occlusal interdigitation, no definite position could be described as centric occlusion. The joint disturbance was considered to be caused primarily by a mesial thrusting of the mandible combined with a loss of posterior tooth support. Since no essential joint surface remained, efforts

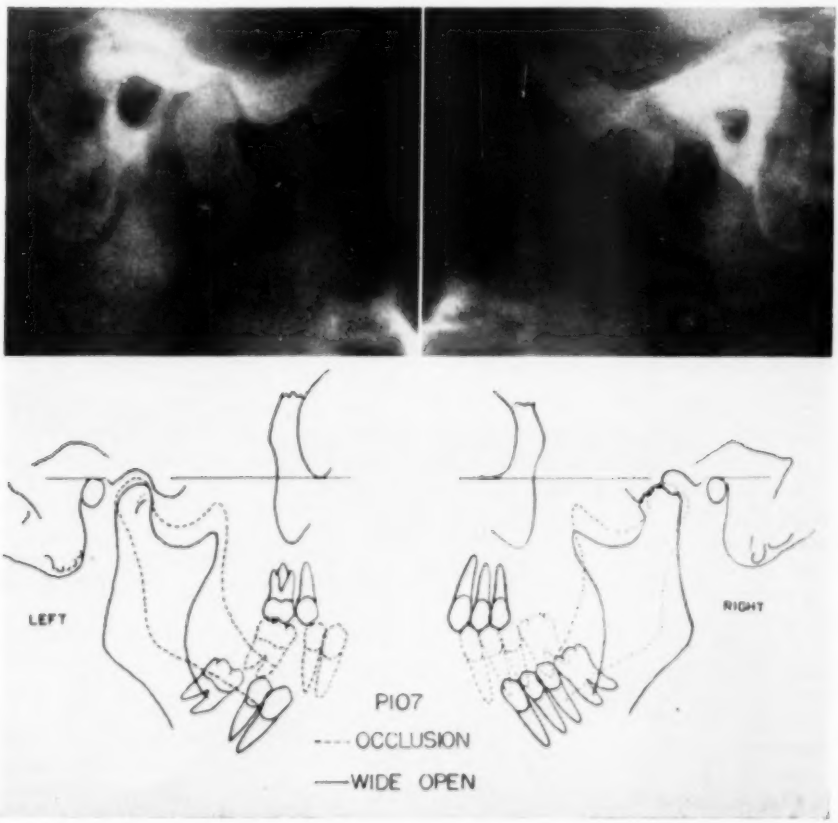


Fig. 18 • Laminagrams and tracings of Case P107. Left articulation is essentially normal. Note arthritic changes in right joint together with mesial position of condyle. Note also limited movement of both condyles in opening

in the treatment of the patient had to be directed at obtaining a maximum rehabilitation of the musculature.

It was decided that a splint on the lower dental arch would relieve the trauma in the joint and that a definite occlusion would permit the muscles to return to their natural behavior. This procedure was planned to include a building up of the cuspid to help guide the stroke of the mandible.

A flat acrylic resin splint was placed to cover the entire occlusal surface of the lower dental arch, and one week later the splint was adjusted to the functional excursions of the mandible. Three months later the patient had almost complete relief from pain, and only slight crepitation could be heard in the right joint. Lateral excursions were free, and the patient expressed delight at being able to know where to chew.

One year later a new lower splint of a more permanent nature was constructed. Laminagrams at this time indicated no change in the left temporomandibular joint. The degenerative changes in the right joint, however, had continued, although the patient was free from discomfort.

Case 5: The Absence of Muscle Activity and Its Effect on the Dental Mechanism •

Records • A ten year old boy, while being treated by an orthodontist, had a siege of illness thought to be a severe cold. Subsequently, it was noticed that the mandible deviated to the right as the patient opened his mouth. No such deviation had been noted in the pretreatment examination. When muscle atrophy was observed, the case was referred for diagnosis. On the basis of functional disturbances poliomyelitis was inferred but could not be proved.

Examination at age 14 revealed limited movement in opening and protrusive movement with a marked deviation to the right side. Excursions to both sides could be made, but the patient preferred to chew on the left side. No contractions were palpable in the right temporal muscle, and only slight contraction could be felt in the right masseter as the teeth were clenched.

Simultaneous bilateral electromyographic recordings were obtained from both temporal and masseter muscles during forced centric occlusion. The difference in the amplitude of the action potentials disclosed the reduced innervational activity of the muscles on the right side[33] (Fig. 19, above).

The profile photograph revealed a balance and harmony of face and lip musculature consistent with the malocclusion. Asymmetry was observed in the frontal photograph. The right side was relatively flat, and the chin point was deviated to the right. The left side appeared more convex and suggested a greater abundance of tissue on that side (Fig. 19, center left and right).

The intraoral roentgenograms revealed differences in bone density between the two sides. The bone on the right side was relatively thinner and more porous with an indistinct trabecular pattern. Tooth development and eruption were delayed on the right side.

The models indicated that a Class II molar relation had been corrected on the left side but that the right side had remained in end-to-end occlusion. The right lower buccal segment was somewhat lingually inclined. The upper buccal segment appeared symmetrical. The right second molars were not erupted (Fig. 19, below).

The laminagram of the right side showed no abnormality of the articulating surfaces, but malrelation in condyle position was clearly demonstrated. In full occlusion of the teeth the condyle was located in a downward and backward position in the fossa. The condylar-meatal distance was 5 mm., and the condylar-

33. Pruzansky, Samuel. The application of electromyography to dental research. J.A.D.A. 44:49 Jan. 1952.

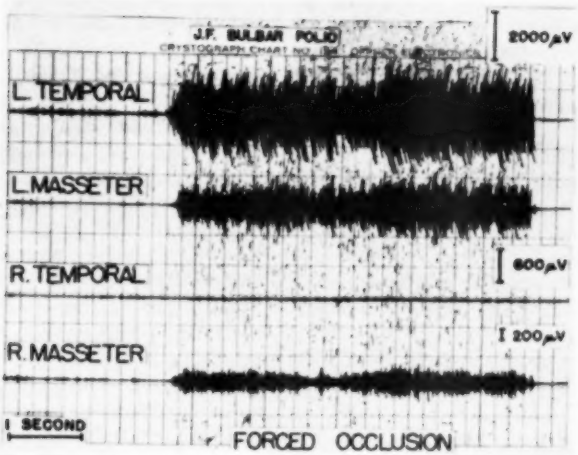


Fig. 19 • Case P116. Above: Electromyographic recordings. Note diminished contractions in right masseter and almost complete absence of contractions in right temporalis. Right and left: Note flattened appearance of right side of face due to loss of muscle resulting from poliomyelitis. Below: Note Class II malocclusion on affected side and lack of eruption of second molars

eminential measurement was 8 mm. As the mouth was opened, the condyle traveled upward and forward into a well centered position in the fossa. In incision the right condyle moved forward, but in excursions it moved very little.

A comparison of the two sides of the mandible revealed asymmetry in size. The right ramus was narrow, and the neck of the condyle was long. On the left side the distance from the posterior border of the ramus to the lower molar teeth suggested either that the teeth on the right had not drifted forward or that the mandible had not grown properly (Fig. 20).

Analysis of Findings • The etiology of the original malocclusion is unknown. Ordinarily the treatment of this type of malocclusion is uncomplicated, but in this case the loss of muscle activity had altered the forces of occlusion. This condition introduced secondary factors which acted against growth and development and made ideal treatment impossible.

With treatment a satisfactory relation was established on the left side. The fact that the right side was not corrected indicated that there was interference with the normal processes of development. Restriction of mastication to the left side predisposed the right side to lingual collapse. This combination of developmental and functional disturbances provided an explanation for the unerupted second molars.

Biologic Correlations • There was considerable loss of muscle activity in a portion of the muscles of mastication. Steindler has described the phenomenon which takes place in the remaining muscle as an "imbalance contracture." The nonfunctioning muscle affords only its elasticity against the contraction of the healthy muscle, and the new arrangement of muscle distribution about the joints results in a new pathologic equilibrium which is a permanent condition.

Thus the question arises of the role of ligament versus muscle as stabilizers of joints. It has been stated repeatedly that the ligament, as a tissue, acts as a check or restraint for the joint. In the present case there was a condition in which a muscle had atrophied with the resultant loss of the normal relation of the condyle in the fossa. This situation seems to indicate that the muscle acted as a stabilizer, since a ligament cannot permanently withstand the amount of stretch present.

Every muscle has a stabilizing and a mobilizing component, and every joint is surrounded by such an arrangement. Usually more work is performed by the muscles in producing a stabilizing effect than in producing the obvious movement.[34] It is apparent that both stabilization and movement had been impaired in this case.

Diagnosis and Treatment • It is well established that the paralysis of muscle is due to a destruction of the lower motor neuron. Consequently the nerve involved is damaged permanently. The only treatment that will strengthen the remaining healthy muscles is exercise.

Since in this case the forces of occlusion were permanently altered, efforts were made to establish the best esthetic and functional balance that the muscular environment afforded. Ideal symmetrical arch form was modified to fit the pathologic balance because of the impossibility of rehabilitation of musculature to a new position of the teeth.

DISCUSSION

Rest Position • The physiologic rest position of the mandible as described by Thompson has become a valuable reference position. The findings in this investigation seem to indicate that this concept

34. Steindler, Arthur: Mechanics of normal and pathological locomotion in man, Springfield, Ill., Charles C Thomas, 1935.

should be enlarged to include consideration of the position of the condyle in the fossa.

The downward and forward position of the condyle in rest position in Class II cases, especially when the upper incisors protrude noticeably, suggests that in addition to influences of the postural system, proprioceptive influences arising from the masticatory and respiratory systems must also be included in the analysis of rest position. Several observations lead to this contention.

The function of incision is greatly altered in the Class II malocclusion. In order to establish incisal contact, the mandible is protruded far beyond normal limits (Fig. 11). Muscle activity, therefore, differs greatly from that in normal cases. The protruding muscles, primarily the external pterygoids, are hyperfunctional in such cases.

It is noticed also that many patients with this condition protrude the mandible as an aid in producing certain speech sounds. The consonants "b," "p" and

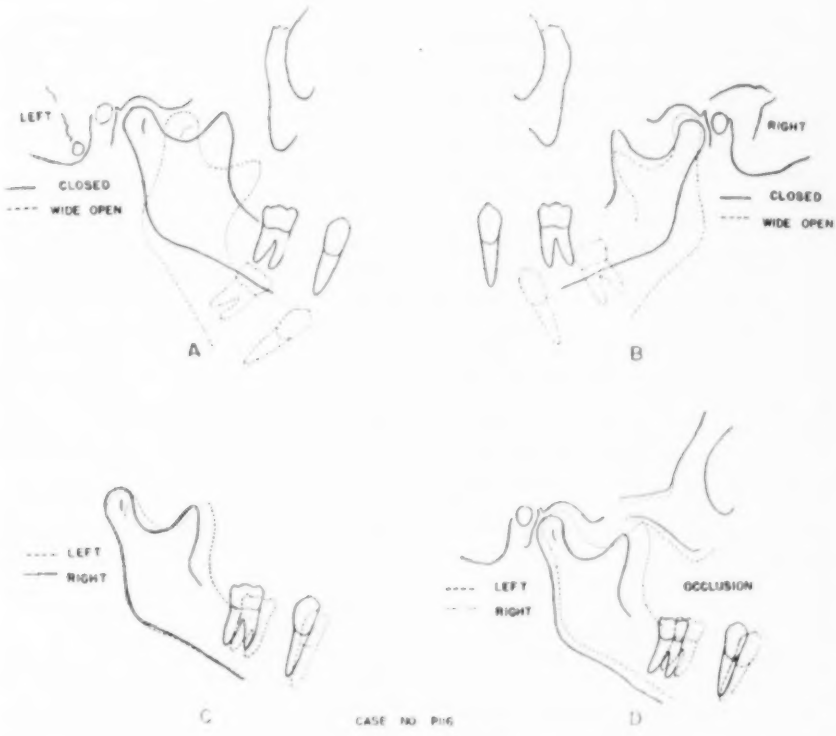


Fig. 20 • Laminagraphic tracings of Case P116. A: Left side, normal opening and normal morphology. B: Right side, abnormal opening and thin condyloid process. C: Right and left tracings superimposed on angle of ramus. Note narrower ramus of affected side and shorter distance from posterior border of ramus to molar tooth on that side. D: Right and left tracings superimposed on Frankfort plane. Note posterior position of condyle on right side together with differences in zygomatic arch of that side

"m" call for closure of the lips, and in the "w" sound the lips must be rounded. The "s" sound is made by the action of the tongue and lower incisors in relation to the upper incisors. In cases of deep overbite or protruding upper anterior teeth, the mandible is opened or brought forward respectively to aid in producing proper air pulsations for these sounds. If such mandibular adjustments are not made, the lips and tongue make the accommodation; or the sounds are not pronounced distinctly. In this way, speech, being a modification of respiratory activity, may exert subtle influences that affect physiologic rest position of the mandible.

Mandibular position also is directly involved in respiration because of the relation of the airway to those structures of the floor of the mouth and the pharynx which are attached to the mandible. The importance of this anatomical arrangement is illustrated in cases of micrognathia in infants, when the child labors to protrude the lower jaw with almost every breath. It is demonstrated also in cases of poliomyelitis of the pharyngeal and hyoid muscles, when the patient holds the mandible forward to prevent collapse of the throat and obstruction of the airway.

There is a sound neurological basis for these observations, since muscle movements tend to achieve maximum effect with minimum effort. In other words, the mandibular rest position can be considered a functional position of the mandible for purposes of conservation of energy. Since respiration is a continuous function, it may, in certain instances, be a greater proprioceptive factor than mastication.

Psychological factors together with postural habits also must be considered. Some patients, because of vanity, make a sustained effort to conceal a malocclusion by various means. These are usually compensatory mandibular repositionings or adaptations of the lips and may be seen in either Class II or Class III conditions. It is common knowledge that forward tilting of the head brings the mandible forward. Once again these influences become important factors because conscious control, once established on a habitual basis, becomes a conditioned reflex.[35]

Functional variations in opening were noted in some patients with extreme skeletal patterns. In light of this observation, relationship of skeletal and muscular patterns should not be disregarded. If the opening path of the mandible was plotted, the rest position could generally be indicated by a point on the resulting path.

These ideas seem to modify some of the basic contentions about physiologic rest position of the mandible. In most Class II cases at least, the occlusal position seems to be a better point for analysis than the rest position. This opinion is based on the assumptions (1) that the physiologic rest position is influenced by the teeth in various states of malocclusion and (2) that in extremely disharmonious skeletal patterns and environmental conditions the musculature may have a compensatory balancing effect at rest. Muscular relations in such instances are abnormal.

Pathology • These studies give striking support to the view that the teeth and muscles have a profound influence on the temporomandibular articulation. The wide variation in the architecture and functional range of the articulation in the normal human being is associated with an equally great variation in skeletal, denture and muscular patterns. In spite of independent variation of the related structures, a detailed analysis of the temporomandibular joint often suggests disturbances elsewhere in the masticatory mechanism. The diagnosis and localization of the inciting cause of these

35. Walsh, J. P. Neurophysiological aspects of mastication. D. J. Australia 23:49 Feb. 1951.

disorders are unquestionably facilitated by the use of cephalometric laminagraphy.

While systemic conditions are recognized as etiological factors in many cases of temporomandibular joint disease, present experience indicates that the occlusion of the teeth should be considered first in the analysis of pathologic joint conditions. Treatment with analgesics, sclerosing agents, wiring of the jaws and surgical removal of the disks is symptomatic treatment; and such treatment, although frequently successful, is based on empiricism and is not grounded in the fundamentals of orthopedic management of joint disorders.

Because of the extreme variation observed in all measurements, it is not possible to generalize in an interpretation of the joint morphology and function. For this reason the mean figures of this analysis have little value. The extremes of the ranges of normal variation seem to be reasonable measures for comparison of individual pathological cases.

Several dental conditions seem to be precipitating factors in temporomandibular joint disturbances. Often two or three factors are observed in the same case. Different treatment is indicated on the basis of diagnosis; and no single method of grinding, splinting or restoration of the vertical dimension is applicable to all cases.

The case studies presented in this paper show the interdependence of the teeth with their supporting bone, with the muscles of mastication and with the temporomandibular joint.[32] Each of these tissues in turn can affect the others under certain circumstances. A thorough knowledge of the biology of bone, muscle and joints usually provides the clinician with the means of interpreting and treating the individual case.

SUMMARY

Cephalometric laminagraphy is a valuable technic when combined with other methods of examination of the temporomandibular joint.

Observations of 230 temporomandibular joints of patients without clinical manifestations of joint disease have shown the following variations: (1) variations in joint morphology characteristic of normal occlusion and Class II and Class III malocclusions, (2) variations in condyle-fossa relations and (3) variations in the opening movement and in the condyle position in wide-mouth opening. Familiarity with these variations is requisite for the understanding of abnormal joint behavior.

The prevailing concept of physiologic rest position of the mandible seems to need certain modifications, since wider variations in rest position were observed than had previously been thought to exist. Possible modifying factors are extreme malocclusion, disharmonious skeletal patterns and the adaptation for functions of mastication, deglutition, respiration, speech and posture. In such cases rest positions are abnormal.

Five pathological cases from among 180 patients with a variety of joint disturbances were selected as representative of the most frequently occurring problems in the author's clinical experience. These cases demonstrate basic principles of mandibular behavior. While the great range of variation almost dispels any hope of applying a general rule to pathological cases, the mandibular behavior in excess of normal variation appears consistent enough to warrant a classification of specific etiological conditions as follows:

1. Excessive range of function of the mandible, usually associated with malocclusion of the Class II Division 1 type and signifying abnormal masticatory and respiratory activity. (This class does not include excessive range in opening.)
2. Distal malplacement of the condyle usually by mechanical interference of the incisor teeth.
3. Excursive interference by the molar

teeth, including cross-bite, with subsequent disturbance of the muscle pattern.

4. Malplacement of the condyle, due to loss of posterior tooth support and subsequent changes in muscular function.

5. Neuromuscular imbalance arising from altered peripheral stimuli or disease processes that affect muscle and nerve in a direct manner.

Systemic defects and their relationship to joint diseases are recognized and should be considered in any differential diagnosis.

15247 Sunset Boulevard

Studies of dentofacial morphology. III. The role of dental caries in the etiology of malocclusion

Walter J. Pelton, D.D.S., M.S.P.H., and William A. Elsasser,† D.D.S., Washington, D. C.*

While the technical strides made in the treatment of malocclusion have been significant, the etiology of the condition still remains an enigma. Heredity, habit, premature loss of primary tooth substance, and various endocrinopathies have been investigated and emphasized as causative factors in producing malocclusion.[1-7] Those interested in genetics have stressed heredity as the underlying cause of malocclusion. Those who are most concerned with thumbsucking, fingernail biting, tongue-thrusting, improper swallowing and other indications of psychological unrest have pointed to these habits as the primary causes of malocclusion. It appears that those preoccupied with habits as etiological factors have joined forces with another group of environmentalists, the supporters of the hypothesis that premature loss of deciduous teeth is a potent factor in the genesis of malocclusion. Endocrinopathies, which may themselves be either genetically or environmentally determined, are pointed to by proponents of both groups as basic causes of malocclusion.[8] In short, the etiology of malocclusion has become another of those biological problems arousing discussion as

Presented before the Section on Public Health Dentistry combined with the Section on Research, ninety-third annual session of the American Dental Association, St. Louis, September 11, 1952.

*Dental director and chief, Division of Dental Resources, U. S. Public Health Service.

†Dental surgeon, Division of Dental Resources, U. S. Public Health Service.

1. Wylie, W. L. Malocclusion—malady or malformation? Angle Orthodont. 19:3 Jan. 1949.

2. Wylie, W. L. Heredity and the orthodontist—a study in confusion. Am. J. Orthodont. & Oral Surg. (Oral Surg. Sect.) 33:154 March 1947.

3. Stockard, Charles R., and others. The genetic and endocrinic basis for differences in form and behavior. Philadelphia, Wistar Institute, 1941.

4. Adams, F. L. Habits which affect the teeth and structures of the oral cavity. J. Florida D. Soc. 20:13 Dec. 1949.

5. Gilbert, B. W. On thumbsucking. J.A.D.A. 39:612 Nov. 1949.

6. Hart, D. S. Abnormal loss of deciduous teeth. Chron. Omaha Dist. D. Soc. 2:7 Feb. 18, 1948.

7. Lang, M. R. Relation of the endocrines to dental development and oral health. J. Canad. D. A. 15:480 Sept. 1949.

8. Breitner, Carl. Etiologic factors in dento-facial anomalies. J.A.D.A. 32:181 Feb. 1945.

to the relative importance of heredity versus environment in the molding of the individual.

Recent research indicates that most of the morphologic anomalies, malocclusion included, are genetic in background. The original genetic pattern, however, is by no means immutable, since environmental factors modify it extensively.[9] It is likely, therefore, that the background of malocclusion is dependent on genetic make-up but that superimposed environmental factors can greatly modify the original dentofacial pattern. The aberrations of the face, jaws and teeth appear to involve both genetic and environmental factors. The problem of the etiology of malocclusion should therefore be approached, not from the standpoint of designating a single genetic or environmental factor as the primary cause, but rather from the standpoint of determining how much each factor contributes to the genesis of malocclusion.

With the development of the dentofacial index,[10,11] it is now possible to study the epidemiology of malocclusion in relation to such characteristics as dental caries. The role of dental caries in the etiology of malocclusion was chosen first in this series of investigations because of the ease of deriving caries incidence rates and because of the recent knowledge that fluoride ingestion has a striking effect on dental caries attack rates. It has been claimed that children residing in a fluoride area have 30 per cent less malocclusion than children reared in fluoride-free areas.[12]

A previous study of adolescents[13] indicates that after the extraction of first permanent molars the continuity of the arches is broken and consequently the adjacent teeth are damaged by decay and trauma. The hypothesis has been advanced that loss of tooth substance either through extraction or decay results in loss of continuity in the dental arches, abnormal arch relationship and consequent malocclusion.[14]

METHOD

Information on the relationship between dental caries and malocclusion may be obtained by comparing a population group having a high incidence of dental caries with one which is relatively caries-free. Accordingly, the grade school children in two cities in Idaho, Coeur d'Alene and Nampa, were selected for comparison. Throughout the lifetime of the children in the study groups the domestic water supply of Coeur d'Alene was fluoride-free while that of Nampa contained 1.5 ppm of fluorides. Data supplied by the Idaho State Health Department indicated that the water supplies had remained chemically unchanged in both cities since 1937. Census data showed that 90.4 per cent of the population[15] in Coeur d'Alene and 96.4 per cent of the population in Nampa was white and native-born.

In both cities those children from grades one through seven who had maintained continuous residence from birth were included in the study. Each child received a clinical orthodontic and orthometric examination as well as an examination for dental caries experience. A portable, adjustable dental chair was used with natural light supplemented by artificial light and new mouth mirrors and explorers. The information for the caries data was coded in accordance with

9. Boyd, William C. Genetics and the races of man: an introduction to modern physical anthropology. Boston, Little, Brown & Co., 1950, p. 82-87.

10. Elsasser, W. A. Studies of dento-facial morphology. I. A simple instrument for appraising variations. Angle Orthodont. 21:163 July 1951.

11. Elsasser, W. A. Studies of dentofacial morphology. II. Orthometric analysis of facial pattern. Am. J. Orthodont. 39:193 March 1953.

12. Plater, W. R. Caries control: its influence and effects on malocclusion. Am. J. Orthodont. 35:790 Oct. 1949.

13. Salzmann, J. A. A study of orthodontic and facial changes, and effects on dentition attending the loss of first molars in five hundred adolescents. J.A.D.A. & D. Cosmos. 25:892 June 1938.

14. Salzmann, J. A. Principles of orthodontics, ed. 2. Philadelphia, J. B. Lippincott Co., 1950, p. 395-456.

15. U. S. Department of Commerce, Bureau of the Census. Sixteenth census of the United States: 1940. Population, vol. II, Characteristics of the population.

Table 1 • Number of children examined and average DMF per child in selected age groups, Coeur d'Alene and Nampa, Idaho

Age group examined	Coeur d'Alene		Nampa	
	Number examined	DMF (average)	Number examined	DMF (average)
6-13	348	3.80	502	0.79
6	58	0.69	113	0.13
7	58	1.93	77	0.35
8	64	3.16	83	0.71
9	43	3.88	63	0.89
10	42	5.00	37	1.32
11	35	5.74	48	1.12
12	22	6.09	46	1.52
13	26	9.85	35	1.97

Table 2 • Number of children examined and average DFI per child in selected age groups, Coeur d'Alene and Nampa, Idaho

Age group examined	Coeur d'Alene		Nampa	
	Number examined	DFI (average)	Number examined	DFI (average)
6-13	348	4.88	502	4.54
6	58	4.00	113	3.99
7	58	4.53	77	4.38
8	64	4.67	83	4.69
9	43	5.09	63	4.78
10	42	6.07	37	4.38
11	35	6.23	48	4.73
12	22	5.32	46	5.41
13	26	3.65	35	4.63

a method described in detail by Klein and Palmer.[16] The results of the orthometric examination were recorded according to a method used previously.[10] The observations from the orthodontic examination were recorded in descriptive terms. The dental caries data were expressed in terms of DMF teeth. The dentofacial findings were expressed in terms of the dentofacial index, the values of which range from 0, indicating no malocclusion, to 21, indicating extreme malocclusion.

PRESENTATION OF DATA

The present analysis is restricted to children between the ages of 6 and 13. There were 348 children examined in Coeur d'Alene and 502 in Nampa. A summary of the decayed, missing and filled teeth (DMF), as well as the dentofacial index (DFI), was calculated for each child. DMF and DFI values were calculated also for each age group and for the entire group. Age-specific averages for these data are shown in Tables 1 and 2.

In addition to the dental caries experience (DMF) and the dentofacial index (DFI), calculations were made separately for missing teeth, including those teeth whose extraction was indicated, and for selected components of the dentofacial index as follows:

Missing teeth:

1. The number of missing first permanent molars per child at each age.
2. The number of missing upper second deciduous molars per child at each age.
3. The number of missing lower second deciduous molars per child at each age.
4. The combined number of missing upper and lower second deciduous molars per child at each age.

DFI components:

1. The number and per cent of children with cross-bite at each age.
2. The number and per cent of children with crowded arch at each age.
3. The number and per cent of children with cross-bite and crowded arch at each age.

Table 3 presents data assembled for the selected DFI components, while Table 4 lists the average numbers of missing first permanent and second deciduous molars.

DISCUSSION

In order to demonstrate the relationship of malocclusion to dental caries, the DFI and the DMF rates were plotted against age for Nampa and Coeur d'Alene children (Fig. 1). The graph indicates an

16. Klein, Henry, and Palmer, C. E. Studies on dental caries: X. A procedure for the recording and statistical processing of dental examination findings. J. D. Res. 19:243 June 1940.

Table 3 • Number of children examined and per cent showing cross-bite, crowded arch and both cross-bite and crowded arch in selected age groups, Coeur d'Alene and Nampa, Idaho

Age group examined	Coeur d'Alene				Nampa			
	Number examined	Per cent with			Number examined	Per cent with		
		Cross-bite	Crowded arch	Both cross-bite and crowded arch		Cross-bite	Crowded arch	Both cross-bite and crowded arch
6-13	348	14	66	11	502	8	67	7
6	58	12	43	10	113	9	47	5
7	58	14	74	10	77	8	62	4
8	64	14	64	11	83	11	76	11
9	43	7	72	7	63	6	78	6
10	42	19	69	19	37	8	76	8
11	35	26	80	23	48	8	73	8
12	22	14	64	5	46	11	72	11
13	26	4	65	4	35	0	71	0

extremely low initial DMF rate per child in Nampa at age 6 with a gradual rise until age 13, except for the 11 year age rate, for which the value is slightly lower than that for the 10 and 12 year age groups. Even at age 13, the DMF rate is low. The Coeur d'Alene children at age 6 show an initial DMF rate which is 5 times that of Nampa. A steady, sharp rise occurs through the entire age range with values consistently four to six times greater age by age than in Nampa. The Coeur d'Alene DFI curve rises steadily from ages 6 to 10, levels off at 11, and drops at ages 12 and 13. The Nampa DFI curve rises steadily, paralleling the rise of the DFI curve for Coeur d'Alene until age 9, it drops slightly at age 10, rises again to age 12 and drops off slightly at age 13. Since there was a slight difference in the DFI of the two groups in the two towns, the data for the DFI

Table 4 • Number of children examined and average number of missing (upper and lower) first permanent molars, upper second deciduous molars and lower second deciduous molars per child in selected age groups, Coeur d'Alene and Nampa, Idaho*

Age group examined	Coeur d'Alene				Nampa			
	Number examined	Number of teeth missing per child			Number examined	Number of teeth missing per child		
		First permanent molars	Second deciduous molars			First permanent molars	Second deciduous molars	
			Upper	Lower			Upper	Lower
6-13	348	0.25	0.19	0.41	502	0.02	0.08	0.10
6	58	0.	0.07	0.38	113	0.	0.01	0.04
7	58	0.07	0.09	0.36	77	0.	0.04	0.03
8	64	0.14	0.25	0.53	83	0.	0.06	0.14
9	43	0.28	0.35	0.77	63	0.03	0.14	0.14
10	42	0.36	0.31	0.40	37	0.14	0.19	0.27
11	35	0.54	0.14	0.17	48	0.06	0.12	0.08
12	22	0.41	0.27	0.36	46	0.04	0.15	0.11
13	26	0.73	0.04	0	35	0.	0	0.03

*Included as missing are those teeth whose extraction is indicated.

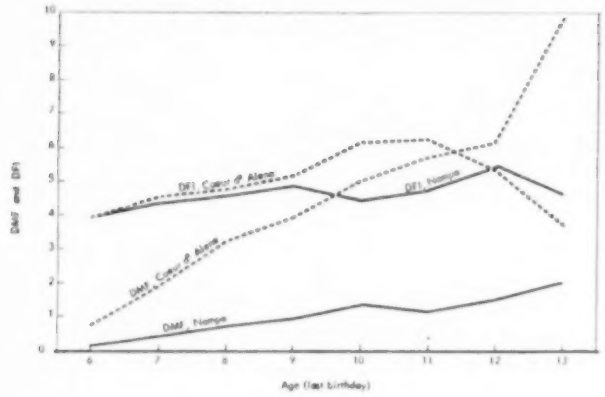


Figure 1

were tested statistically and found lacking in significance of difference.

Since there was a great difference in DMF rates in the Coeur d'Alene and Nampa children and only an insignificant difference in DFI rates, it appears that dental caries is not a highly significant factor in the production of malocclusion. The age-specific data are insufficient at this time to make a positive statement concerning the relationship between dental caries and malocclusion in general, but the data are significant enough to predict that a larger sample will probably confirm the absence of significant relationship between dental caries and the genesis of malocclusion.

Up to this point, only the general relationship between dental caries and the etiology of malocclusion has been discussed. It has been shown that there was a considerable difference in the DMF rates of children under observation in the two cities while the DFI rates were almost the same. In order to analyze this phenomenon, two components of the DFI, crowded arch and cross-bite, were subjected to special study. The percentage of children with each condition was plotted against age and compared with

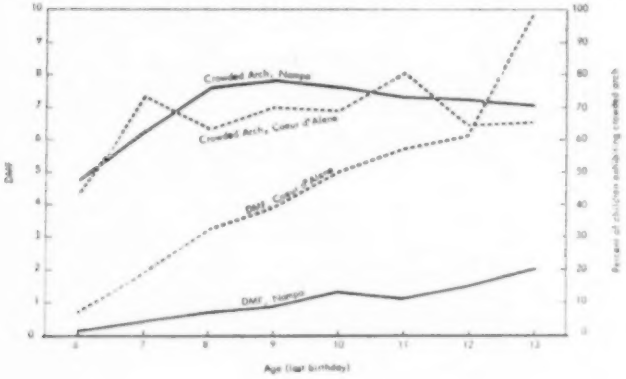


Figure 2

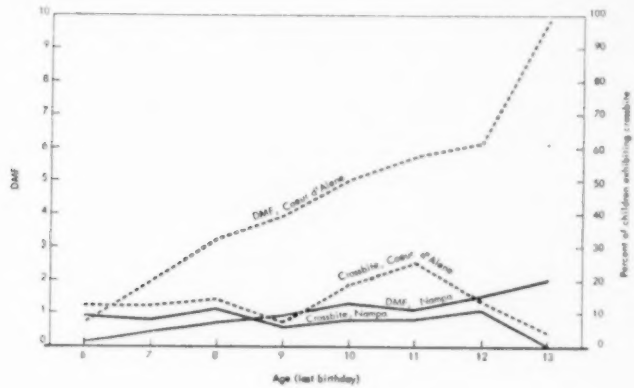


Figure 3

the age-specific DMF rates (Fig. 2 and 3).

In Figure 2 the curves for the percentage of Coeur d'Alene and Nampa children with crowded arch are plotted with the caries experience curves for the Coeur d'Alene and Nampa children. The data from which the crowded arch curves for Coeur d'Alene and Nampa children were derived were not found to be significantly different. The lack of correlation between crowded arch and dental caries experience is indicated by the strikingly lower DMF rate for the Nampa children. Thus it appears that there is not a readily discernible direct relationship between crowded dental arch and loss of tooth substance resulting from caries attack.

The possibility of a causal relationship between the DMF rate and crowded arch may be tested by a comparison of the DMF rate of Coeur d'Alene or Nampa children who have crowded arch with the DMF rate of those who do not have crowded arch (Table 5). Although the children of Coeur d'Alene with crowded arch have a considerably higher average DMF rate than those without crowded

Table 5 • Number of children examined and average DMF for children with and children without crowded arch in selected age groups, Coeur d'Alene and Nampa, Idaho

Age group examined	Coeur d'Alene				Nampa			
	Children with crowded arch		Children without crowded arch		Children with crowded arch		Children without crowded arch	
	Number examined	DMF (average)	Number examined	DMF (average)	Number examined	DMF (average)	Number examined	DMF (average)
6-13	228	4.15	120	3.13	334	0.78	168	0.82
6	25	0.92	33	0.52	53	0.21	60	0.07
7	43	1.95	15	1.87	48	0.40	29	0.28
8	41	3.05	23	3.35	63	0.59	20	1.10
9	31	4.00	12	3.58	49	0.71	14	1.50
10	29	5.14	13	4.69	28	1.43	9	1.00
11	28	5.96	7	4.86	35	1.23	13	0.85
12	14	6.64	8	5.12	33	1.24	13	2.23
13	17	10.65	9	8.33	25	1.44	10	3.30

Table 6 • Number of children examined and average DMF for children with and children without cross-bite in selected age groups, Coeur d'Alene and Nampa, Idaho

Age group examined	Coeur d'Alene				Nampa			
	Children with cross-bite		Children without cross-bite		Children with cross-bite		Children without cross-bite	
	Number examined	DMF (average)	Number examined	DMF (average)	Number examined	DMF (average)	Number examined	DMF (average)
6-13	48	4.42	300	3.70	41	0.61	461	0.81
6	7	1.43	51	0.59	10	0.	103	0.15
7	8	2.00	50	1.92	6	0.50	71	0.34
8	9	2.89	55	3.20	9	0.67	74	0.72
9	3	2.67	40	3.98	4	0.25	59	0.93
10	8	6.12	34	4.74	3	2.33	34	1.24
11	9	8.78	26	4.69	4	0.75	44	1.16
12	3	5.67	19	6.16	5	1.00	41	1.59
13	1	7.00	25	9.96	0	0.	35	1.97

arch, a similar difference does not exist in the children of Nampa. More significantly, the children of Coeur d'Alene have generally a much higher average DMF rate both in the group with crowded arch and in the group without crowded arch than do the corresponding groups of Nampa. This relation would hardly be expected if there were a causal relation between DMF rate and crowded arch.

A possible explanation of this phenomenon may lie in the observation that loss of teeth in the buccal segments gives some crowded anterior segments an opportunity to achieve regularity in position. This, of course, is the rationale underlying extraction therapy in orthodontics.[17-19] In an analysis of tooth movement following extraction of first permanent molars,[19] it was stated that spaces are closed by mesial movement of second permanent molars and by distal movement of second and first bicuspids. This alteration of tooth position is such that the anterior teeth if crowded before the loss of the molars have an opportunity to move into better alignment. As for the early loss of deciduous teeth, a well documented report[20] recommends extraction of deciduous teeth in some cases to relieve the crowded arch condition during the period of mixed dentition.

When the cross-bite rate was plotted and compared with the DMF rate as in Figure 3, a more positive relationship was found than that between crowded arch rate and the DMF rate. The percentage of children with a cross-bite was considerably higher in Coeur d'Alene than in Nampa. This is in direct relationship to a high DMF rate in Coeur d'Alene and a low one in Nampa.

Nevertheless, when the possible causal relationship between cross-bite and DMF rate is tested by comparison of the DMF rate of either Coeur d'Alene or Nampa children who have cross-bite with those who do not have cross-bite, there is no apparent relation between the DMF rate and cross-bite (Table 6). The DMF rate of children with cross-bite is not consist-

17. Grieve, G. W. Anatomical and clinical problems involved where extraction is indicated in orthodontic treatment. Am. A. Orthodont. Tr., 1944, p. 54.

18. Howes, A. E. Case analysis and treatment planning based upon the relationship of the tooth material to its supporting bone. Am. J. Orthodont. & Oral Surg. 33:499 Aug.; Correction 33:690 Oct. 1947.

19. Ballard, M. L., and Wylie, W. L. Mixed dentition case analysis—estimating size of unerupted permanent teeth. Am. J. Orthodont. & Oral Surg. 33:754 Nov. 1947.

20. Nance, H. N. Limitations of orthodontic treatment. Am. J. Orthodont. & Oral Surg. 33:177 April; 33:253 May 1947.

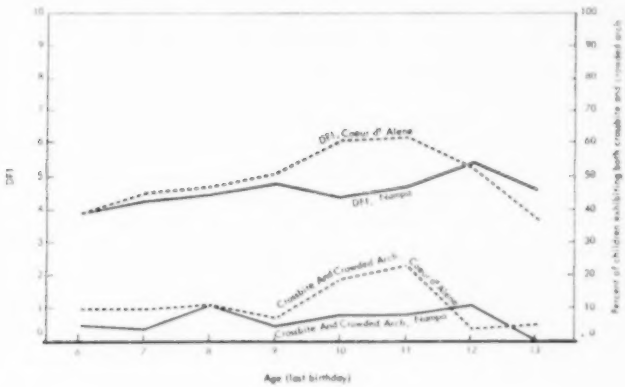


Figure 4

ently higher on the average in either community than the DMF rate of children without cross-bite. Furthermore, the DMF rate of Coeur d'Alene children with and without cross-bite is generally higher than the DMF rate of Nampa children with and without cross-bite. This relation could hardly be expected if there were a causal relation between DMF rate and cross-bite.

Figure 4 shows the relationship of the DFI and combined cross-bite and crowded arch averages of Coeur d'Alene and Nampa children. It is significant that the percentage of children with both cross-bite and crowded arches in Coeur d'Alene at ages 10 and 11 is more than double the percentage of children showing the same condition in Nampa. This may explain the difference at these ages in DFI between the two communities. It is significant that nearing the end of the transition period from mixed to permanent dentition (ages 10 to 12), the dentofacial indexes for both communities approach and parallel each other again at ages 12 to 13. A possible reason for this is that cross-bite ceases to be an important factor in the production of malocclusion at approximately the time of eruption of the second permanent molars.

Figures 5, 6 and 7 indicate the relationship between missing first permanent molars, lower second deciduous molars, upper second deciduous molars and the DFI respectively in Coeur d'Alene and Nampa children. Coeur d'Alene children were found to have an increasing number of first permanent molars missing per child as age increased, while Nampa children lost few permanent molars. Nevertheless, as pointed out before, the over-all DFI was essentially the same in both cities (Fig. 5).

Data do not suggest that missing lower or missing upper second deciduous molars influence the DFI (Fig. 6 and 7). When consolidated (Fig. 8), these data emphasize the difference in the loss of second deciduous molars in the children of the two cities. This difference reflects the lowered caries experience in Nampa, the fluoride community. The relationship of missing second deciduous molars to the DFI, however, coincides with the formerly indicated negative relationship of the DMF rates to DFI (Fig. 1).

SUMMARY

The purpose of this study was to investigate the prevalence of malocclusion in children and to measure the effect, if any, of dental caries prevalence on dentofacial deformities. The development of the orthometer for obtaining the dentofacial

index (DFI) presented a valuable method, used here for the first time, for applying epidemiological technics to the problem of malocclusion.

An analysis of the data obtained on the two groups of native-born children, one living continuously in a nonfluoride area and having nearly five times as much dental caries as the other group living in a fluoride community, revealed the following information:

1. While dental caries experience differed, the dentofacial index (DFI) was essentially the same in both communities.

2. Crowded arch and dental caries were unrelated.

3. The prevalence of cross-bite was shown to be slightly higher in the community with the higher dental caries experience during the age period 6 to 9 years. At ages 10 and 11 the prevalence of cross-bite was considerably greater in the community with the higher dental caries experience. At age 13 cross-bite ceased to be an important factor in malocclusion in either community.

4. When the percentages of children with both cross-bite and crowded arch

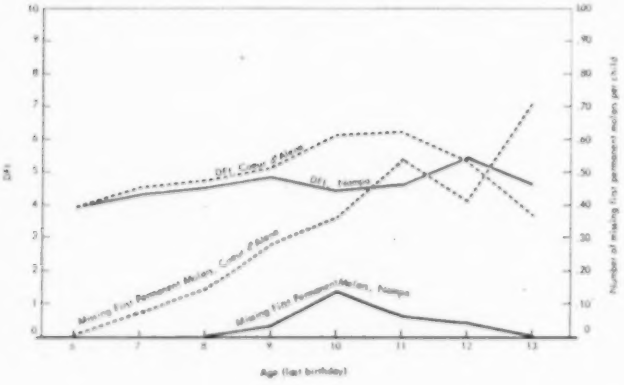


Figure 5

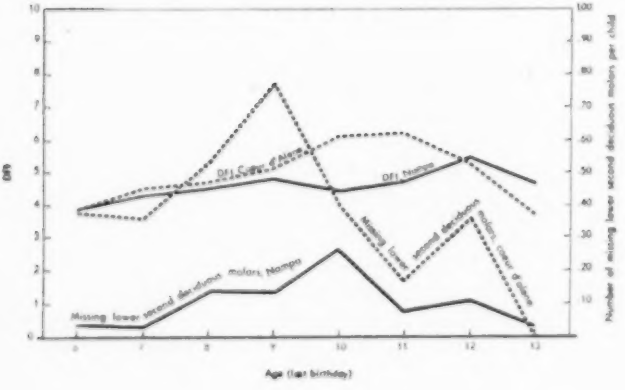

DFI, Grand Rapids
DFI, Nampa
Missing lower second deciduous molars, Grand Rapids
Missing lower second deciduous molars, Nampa
Age (last birthday)

Figure 6

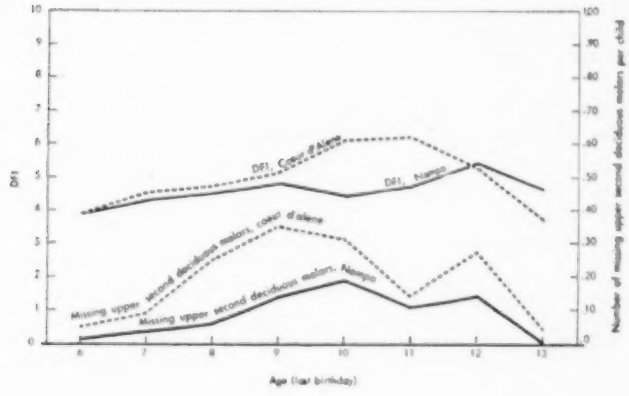

DFI, Coeur d'Alene
DFI, Nampa
Missing upper second deciduous molars, coeur d'alene
Missing upper second deciduous molars, Nampa
DFI
Number of missing upper second deciduous molars per child
Age (last birthday)

Figure 7

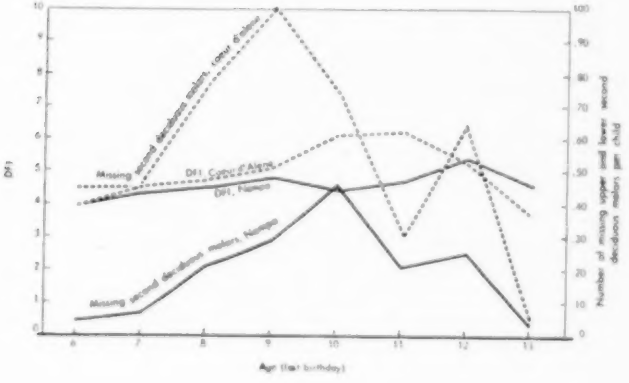

Missing second deciduous molars, coeur d'alene
DFI, Coeur d'Alene
DFI, Nampa
Missing second deciduous molars, Nampa
DFI
Number of missing upper and lower second deciduous molars per child
Age (last birthday)

Figure 8

were compared age by age for the two study groups, the differences closely approximated those ascertained when areas were compared on the basis of the percentages of children with cross-bite. This similarity of pattern reflects the fact that 80 per cent of the children with cross-bite also had crowded arch.

5. Missing first permanent molars and second deciduous molars did not appear to influence the dentofacial index (DFI) but did reflect the difference in dental caries experience between the two groups of children.

CONCLUSION

Although the results of this study do not indicate that dental caries is unimportant in specific cases of malocclusion, the hypothesis which regards dental caries as a primary etiologic factor in malocclusion is not supported by the data obtained in this study.

Mouth breathing. II. Diagnosis and treatment

Maury Massler, D.D.S., M.S., and Jack D. Zwemer,† D.D.S., M.S., Chicago*

Mouth breathing is a common and important clinical problem. It has been estimated that 85 per cent of all children suffer from some degree of nasal insufficiency as revealed by functional tests.[1] Twenty per cent breathe through the mouth habitually.[2,3]

Mouth breathing is the concern of all who deal with the health of the child—the rhinologist, the pediatrician, the orthodontist and the pedodontist. While various specialists have emphasized different aspects of the problem, all are agreed that the condition is detrimental to health. The specialists have viewed the problem from different aspects with the result that the literature contains varied and conflicting opinions as to the causes of mouth breathing and the effects on the different structures of the body. Also, different viewpoints have resulted with regard to correct diagnosis and proper treatment of the condition.

In an effort to clarify this situation, the literature dealing with the causes and the effects of mouth breathing were reviewed recently by Emslie, Massler and Zwemer.[4] The purpose of the present paper is to discuss the diagnosis and treatment of mouth breathing.

DIAGNOSIS OF MOUTH BREATHING

It is important to determine the type and character of the mouth breathing, since such information will greatly influence the treatment. Thus, mouth breathing on an obstructive basis should be treated by the rhinologist; whereas, habitual mouth breathing is best corrected by the pedodontist or orthodontist incidental to the treatment of the oral effects (gingivitis or malocclusions).

Types of Mouth Breathing (Habitual or Obstructive) • A habitual mouth breather often is unaware of his habit and may deny it if he is challenged directly. Habitual mouth breathing often is performed only at night (nocturnal mouth breathing) when the patient is unaware of it.

Obstructive mouth breathing rarely is denied; in fact, it is usually the patient's primary complaint. In both instances, careful clinical examination and testing are necessary in order to determine whether mouth breathing actually exists, and if so, to what degree.

*Professor of graduate pedodontics, University of Illinois College of Dentistry.

†Instructor of histology, embryology and pedodontics, University of Illinois College of Dentistry.

1. Uddströmer, M. Nasal respiration. Acta Otolaryng. (supp.) 42:3, 1940.

2. Giacometti, F. Die Vorhofplatte: ein Beitrag zur Therapie der Mundatmung and zur kausalen Therapie und Prophylaxe des Distalbisses. Ztschr. f. Stomatol. 44:217 May; 271 June 1947.

3. Humphreys, H. F., and Leighton, B. C. A survey of anteroposterior abnormalities of the jaws in children between the ages of two and five and a half years of age. Brit. D.J. 88:3 Jan. 6, 1950.

4. Emslie, R. D.; Massler, M., and Zwemer, J. D. Mouth breathing: I. Etiology and effects (a review). J.A.D.A. 44:506 May 1952.

Degree of Mouth Breathing (Partial or Complete) • Functionally, mouth breathing may be total or partial, continuous or intermittent. If the nasal passages are completely occluded and cannot transmit any air, respiration must be entirely oral. If the nasal passages are only partially occluded, nasal breathing must be supplemented by intermittent oral breathing. One nostril may be adequate for ordinary, shallow respiration, but it is usually insufficient for forced inspiration during mild exercise.

Habitual mouth breathing, too, may be partial or complete, continuous or intermittent. In any case, the functional adequacy of the nasal passages must be tested directly rather than estimated by guess.

It is important to discover whether the mouth breathing is partial or complete since Kantorowicz (quoted by Giacometti[2]) has indicated that no ill effects result from complete mouth breathing, while partial mouth breathing leads to a malocclusion. This is predicated on his assumption that partial mouth breathing requires forceful muscular action in an abnormal manner, while complete mouth breathing is attended by a flaccid, nonfunctional, and therefore noninjurious, muscular action.

TESTING FOR NASAL AND ORAL BREATHING

The ordinary involuntary type of breathing which is quiet and rather shallow should be distinguished from the voluntary, forceful breathing which the child performs on demand. Involuntary or ordinary breathing is tested first. This should be done on a relaxed patient who is uninformed of the purpose of the test, whose eyes are closed and whose respirations are of the normal, shallow type.

The test for the excursion of air is performed with a thin, long strip of tissue paper about 3/8 by 1.5 inches. (A thin wisp of cotton, or a chilled mirror also may be used.) The movement of the paper strip held in front of the nose and lips will demonstrate the excursion of air. The vigor of movement of the test strip is a measure of the amount of respired air (Fig. 1).

It is important to note the difference between the inspiratory and expiratory efforts. Many patients inhale through the mouth and exhale through the nose, especially when the nasal passages are only partially obstructed. This is still mouth breathing.

If mouth breathing is demonstrable during quiet respiration, the dentist must test further in order to determine whether this is on an obstructive basis or is habitual. The child is now instructed to "Breathe through your nose!" If the child is unable to breathe through his nose, or can do so only with difficulty, it is presumptive evidence of nasal obstruction and the child should be referred to the rhinologist at once in order to determine the type and character of the obstruction. If the child can breathe easily through his nose when asked to do so, it is evidence that the mouth breathing is on an habitual basis. Thus, it is not difficult to distinguish between obstructive and habitual mouth breathing.

Fig. 1 • Testing for nasal adequacy with a thin strip of tissue paper

Functional Test • The adequacy of nasal breathing during forced activity should be tested next. The patient is requested to run for a short distance, preferably upstairs, until the respiration becomes forced. The breathing is then tested again. If the nasal passageways are normal, breathing can be performed through the nose. If a partial obstruction exists, breathing will now become gasping and be done entirely through the mouth.

This test usually reveals partial and not obviously obstructive mouth breathing. Such children sometimes are mistaken for "habitual" mouth breathers. The history of the child's activities also is revealing. Children with slight nasal obstructions tend to avoid violent play because the partial obstruction to their breathing makes exercise difficult.

Summary • The type and the degree of mouth breathing must be determined before any attempt is made toward treatment. Obstructive mouth breathing can be detected easily, since the child is unable to breathe through the nose, even on demand. The nature of the obstruction then must be determined by a skillful and careful physical examination of the nasal passages and nasopharynx, preferably by the consultant rhinologist.

Fig. 2 • Method of examining the nasal passages

Habitual mouth breathing may be inferred if the child is able to breathe through the nose when asked to do so, although he normally does not use this method of breathing. The discovery of the ultimate cause of the habit requires a careful analysis of the physical habits, the environment and the history of the patient.

Habitual mouth breathing sometimes may be on the basis of a partial or an intermittent obstruction somewhere in the airway which cannot easily be seen clinically. The obstruction can be detected by a functional test. If, after mild exercise, the child is forced to breathe through his mouth, a partial obstruction or a very narrow airway may be assumed; an airway which is adequate for quiet respiration but inadequate during mild activity. A history of snoring, thirst, and restlessness at night may suggest partial obstruction. Many instances of so-called habitual mouth breathing are, actually, partially obstructive.

It is important to emphasize the role of the anatomic characteristics of the nasal passages as predisposing to both habitual and obstructive mouth breathing. A narrow airway is obstructed easily. This factor must always condition the critical judgment of the clinician who is seeking the cause for habitual mouth breathing.

CLINICAL EXAMINATION

Nasal Examination • Either before or after the actual testing for mouth breathing, the examiner should look directly into the nasal openings in order to note the character of the nasal mucosa (whether normal, pale or reddened); the condition of the middle turbinates (normal or engorged); and the position of the septum (deviated or subluxated to right or left) (Fig. 2). Inspection of the nasal cavities is carried out easily in the dental chair by tilting the tip of the nose upward with the ball of the left thumb and di-

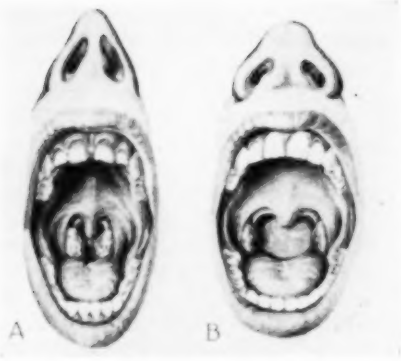


Fig. 3 • Contrasting the size and form of the nasal passages, oral cavity and oropharynx in a narrow-faced child (A) with a broad-faced child (B). Note how easily nasal passages could be occluded by minor obstructions

recting a beam of light into the passageways (Fig. 2). The size and form of the nasal passage can be viewed easily by such direct inspection. In the broad-faced (brachyfacial) type, the nasal passages usually are ovoid and wide, a considerable space being apparent between the middle turbinate and the septum. In the narrow-faced individual (dolichofacial), the nasal passages usually are only a very thin slit, the turbinates frequently making actual contact with the septum, leaving practically no patent airway (Fig. 3). Such passageways are easily "stopped-up" by minor inflammatory engorgements of the nasal mucosa. When actual obstructions or other abnormal conditions are noted, referral to the rhinologist may intercept early pathosis.

Pharyngeal Examination • For a thorough examination, it is not enough to inspect for obstruction of the nasal passageways alone. A careful clinician should inspect the nasopharynx and note the condition of the pharyngeal tonsils (presence or absence; enlarged; inflamed). This examination is carried out readily in the dental chair with the aid of a dental mirror, or preferably a smaller pharyngeal mirror, and a suitable light source. The patient is asked to protrude his tongue. The tongue is then covered with gauze and is held securely by the operator between the thumb and third finger. With the other hand the operator may pass the warmed mirror back past the faucial pillars, avoiding the dorsum of the tongue and soft palate until it is possible to view the nasopharynx with a well-directed light (Fig. 4). A little practice will help the clinician to avoid eliciting the gag reflex. The tongue is pulled forward so that the base of the tongue does not contact the postpharyngeal wall and does not initiate the gag reflex.

Facial Examination • The character of the facies sometimes is indicative of mouth breathing. While it is true that not all mouth breathers have an adenoid facies, the presence of such should make one suspicious of mouth breathing (Fig. 5).

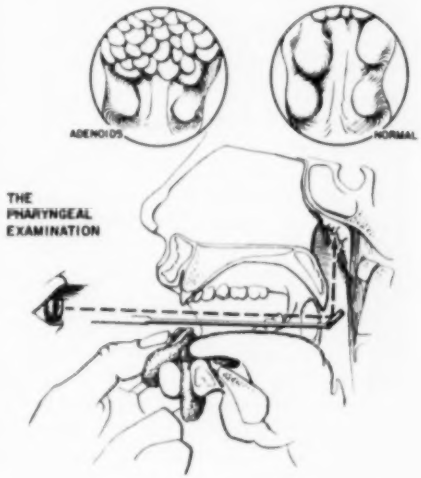


Fig. 4 • Examining the nasopharynx. Note method of drawing tongue forward and position of pharyngeal mirror. Condition of the pharyngeal tonsils are indicated in insets

The long-faced individual is more disposed to mouth breathing than the round-faced person because of his narrow nasal and pharyngeal air passages which are easily obstructed by hypertrophied lymphoid tissues (adenoids), engorged turbinates and septal deviations. Thus, obstructive masses, which in the round-faced individual produce only a slight diminution of the nasal airway, result in complete obstruction in the dolichofacial type.

Oral Examination • A Class II, Division 1, malocclusion may represent a typal characteristic in the long, narrow-faced individual or it may be the result of dental changes accompanying mouth breathing. In any case, a careful evaluation should be made first before any judgment is rendered.

Stagnation of the saliva, bacterial growth and desiccation of the oral epithelium combine to produce in the teen-age child a characteristic hypertrophic marginal gingivitis, usually bright red in color and involving the lingual or the labial gingiva of the upper anterior teeth. Although such a picture may occur in the absence of mouth breathing, the relationship should be ruled out rather than dismissed lightly or leaned upon too heavily.[5,6]

Open-mouth Habit • The open-mouth habit should not be confused with actual mouth breathing.[7] An open-mouth habit does not necessarily prove mouth breathing. Many children habitually keep their lips apart, especially those with a characteristic familial short upper lip. Most of these children breathe normally through their nose. On the other hand, a closed mouth at the time of inspection does not exclude the possibility of intermittent mouth breathing, particularly during sleep. Each child should be tested for functional adequacy of his airway and the nasal passages also should be inspected, however briefly.

If the lip is anatomically short, there usually is no loss of lip tonus and there is not necessarily any protrusion of the upper incisors. The lip merely is short — probably a familial trait. Because of the anatomic deficiency, however, orthodontic treatment will give only a partial correction. Treatment of this condition is possible only by teaching the lower lip to come up and compensate for the short upper lip (mentalis muscle habit).

A short upper lip may be anatomically normal but appear to be short because of protruded incisors (Fig. 5). Orthodontic correction and proper muscle exercises quickly restore the normal appearance of the lip.

Self Correction of Mouth Breathing • It should not be supposed that mouth breathing invariably persists throughout life if it is not corrected during childhood. Mouth breathing and the open-mouth habit occur much less frequently in adults. In many instances, the mouth breathing habit is self-corrected after puberty.

A number of factors contribute to the self-correction of mouth breathing after adolescence, even if the condition is not treated. First, the hypertrophied pharyngeal and palatine lymphoid masses (tonsils and adenoids) atrophy rapidly after puberty. Therefore, these chronic nasopharyngeal obstructions which are commonly found in the child are not often found in the adult. At the same time the nasal and pharyngeal passages increase in size during the period of rapid growth of the child in adolescence. These larger

5. Spicer, Scanes. On nasal obstruction and mouth breathing as factors in the etiology of caries of the teeth, and in the development of the vaulted palate. Brit. J.D. Sc. 33:193 March 1890.

6. Hirschfeld, I. The toothbrush: its use and abuse. New York: Dental Items of Interest Publishing Co., 1939, p. 105, 118.

7. Gwynne-Evans, E. The upper respiratory musculature and orthodontics. Part II. Brit. Soc. for Study of Orthodont. Tr. 1947, p. 165. Also D. Record 68:6 Jan. 1948.

sized airways permit easier nasal breathing in the adult. Finally, the oral sphincter becomes less flaccid and more mature and tonic as the child grows up.[7] Self-consciousness, particularly in the girl, encourages the adolescent to lift the lower lip habitually over the protruding upper incisors in order to hide the teeth and to close her lips[8] (Fig. 6). This mentalis muscle habit is a form of myofunctional therapy and effectively reduces the tendency to breathe through the mouth. The mentalis muscle habit also effectively causes the retrusion of protrusive upper incisors if it is instituted at an early age. When the posterior segments are in normal occlusion and space exists in the upper anterior segment, a complete correction of the occlusion may result. If a Class II molar relation exists and the upper anterior segment is crowded, a Class II, Division 2 type of malocclusion results. In any case the mouth breathing should be corrected during the mixed dentitional period if the deleterious effects on the occlusion of the teeth are to be prevented or corrected. If the mouth breathing is not corrected, either naturally or with the help of an oral screen, before the occlusion of the permanent dentition is stabilized when the child is about 15 years of age, the damage may be permanent.

TREATMENT OF MOUTH BREATHING

Mouth breathing is unphysiologic. When it is discovered, it should be corrected, whatever the cause and whether or not injurious effects can be demonstrated.

8. Ballard, C. F. The upper respiratory musculature and orthodontics. Part I. Brit. Soc. for Study of Orthodont. Tr. 1947, p. 160. Also D. Record 68:1 Jan. 1948.

Fig. 5 • Typical mouth breathing (or adenoid) facies in boy, aged 11. Note narrow facies, hypotonic oral sphincter, open lips, position of lower lip behind upper incisors and protruded upper incisors. Labial surface of these teeth usually was covered with coagulum of dried mucus. Note short upper lip in picture at left, which actually is normal in length, as shown in picture at right

The treatment of mouth breathing should not be planned from the point of view of the specialist (rhinologist, pediatrician, orthodontist or pedodontist) but should be planned in the best interests of the patient. Treatment should be preceded by an appraisal of the total child by a pediatrician. Expert rhinologic examination of the nasopharyngeal airway always should be made before any form of treatment is instituted.

Actual treatment can be divided into three parts: removal of nasal or pharyngeal obstructions by the rhinologist, interception of the habit by the pedodontist and correction of the dental effects by the orthodontist and pedodontist.

REMOVAL OF NASAL OR PHARYNGEAL OBSTRUCTIONS

The first step in the correction of mouth breathing is to insure adequate nasal function by removing all obstructions. It is always wise to consult the rhinologist prior to any dental treatment, since he is most competent in direct examination of the nasopharyngeal passages. Only after the rhinologist has removed all pharyngeal obstructions and has insured a patent nasal airway by means of vasoconstricting nose drops, may the dentist interfere with oral breathing. The danger of anoxia by shutting off the oral passage must not be taken lightly.

INTERCEPTION OF THE HABIT

Removal of pharyngeal and nasal obstructions usually permits normal nasal breathing. In fact, nasal breathing is resumed during the daytime in almost all cases. Frequently, however, mouth breathing will persist during sleep even after the obstruction has been removed, especially in persons with narrow airways. A

Fig. 6 • Showing self-correction of open lip habit and mouth breathing in preadolescent girl. Lower lip has been forced up and over upper incisors by contraction of mentalis muscle. Note characteristic dimpling of chin

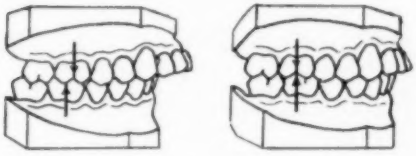
history of tonsillectomy and adenoidectomy is not evidence of nasal breathing. Removal of the lymphoid tissue and reduction of engorged turbinates is evidence only that mouth breathing is not obstructive. It may still be habitual. Many children continue to breathe through the mouth, especially at night, long after obstructive adenoids are removed. In such instances, the habit must be corrected.

Extraoral Devices • Extraoral bandages and adhesive tapes sometimes are prescribed to prevent mouth breathing during the night. They may be painful and may appear punitive to the child so they often fail.[9]

Intraoral Device • Sprawson,[10] Matthews[11] and others employ the oral screen routinely to re-establish nasal breathing after adenoidectomy. The oral screen is a simple and efficient intraoral appliance which prevents the passage of air through the mouth (Fig. 7-12).

THE ORAL SCREEN

The oral screen is a piece of fitted material which rests in the labial and buccal vestibule and thus prevents the passage of air through the mouth. It usually is worn at night to correct the tendency to habitual nocturnal mouth breathing. For this purpose, it is probably the most efficient device yet constructed.



Class II Division I

Fig. 7 • Orientation of casts in order to reduce overjet, when present, prior to making wax pattern for construction of plastic oral screen

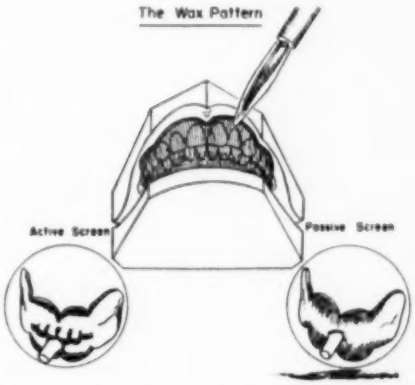


Fig. 8 • Wax pattern. Note impression of teeth to be moved in the active screen

The oral screen may be made of any material compatible with oral tissue—metal, rubber, or plastic. Polystyrene is an excellent material because it is easily and quickly fabricated and it is clean and compatible with the oral tissues.

The device has found many applications and is used extensively in Europe and Australia[12-19, 2, 10, 11, 20, 21] but has not often been employed in this country.[22-27] We have used the oral screen in more than 50 patients, with excellent results.

The action of this appliance is natural. The source of the force is the pressure of the labial musculature transmitted to the teeth.

9. Massler, M., and Wood, A. W. S. Thumbsucking. J. Jen. Children 16:1, 1st quart. 1949.

10. Sprawson, E. C. Foods and feeding as they affect teeth and their environment. Brit. D.J. 83:227 Dec. 1947.

11. Matthews, E. A mouth screen for use after adenoidectomy. Brit. M.J. 2:223 July 1948.

12. James, W. W. The cure of mouth-breathing. Proc. Roy. Soc. Med. (Odont. Sect.) 6:97 Jan. 1913.

13. James, W. W. The anti-mouth breathing valve: an improvement. D. Record 41:68 Feb. 1921.

14. Northcroft, George. An all-metal anti-mouth-breathing valve. Proc. Roy. Soc. Med. (Odont. Sect.) 7:81 April 1914.

15. Izard, G. Orthodontie (dento-faciale orthopadie). Paris, Masson & Cie., 1930.

16. Dickin, H. O. Oral screens in the treatment of certain dental irregularities. Proc. Roy. Soc. Med. (Odont. Sect.) 27:1411, 1934.

Fig. 9 • Pouring the working model. Note anterior teeth in active screen model

INDICATIONS FOR USE OF ORAL SCREEN

Restoration of Nasal Breathing (Passive Screen) • The primary purpose of the oral screen is to correct habitual nocturnal mouth breathing which may persist after adenoidectomy.[10, 11] The screen is passive and rests only in the vestibule. It does not touch the teeth.

Interception of Premaxillary Protrusion (Active Screen) • The active screen rests on the upper incisor teeth instead of simply in the vestibule and is of value in intercepting maxillary incisor protrusion such as occurs in Class II, Division 1, malocclusion. The active oral screen should be used early when upper anterior protrusions exist. In such instances, it is less a corrective appliance than a guiding appliance; that is, it guides the erupting incisors into correct position. The ideal age for its use is therefore from 6 to 12 years. It is especially effective when diastemas exist between the teeth and when the labial musculature is hypotonic.

Adjunct to Orthodontic Treatment • The active oral screen may be used as an adjunct to the orthodontic treatment of Class II, Division 1, malocclusion. When used in conjunction with a complete orthodontic appliance, it shortens the treatment and corrects the etiologic factors involved (mouth breathing and hypotonic labial musculature). It also may be used as a retainer after the correction of a maxillary incisor protrusion.[17]

Other Uses • The oral screen may be used as a device to interfere with other nocturnal oral habits, such as nocturnal finger-sucking or tongue-thrusting. The oral screen presents a mechanical barrier either to the initiation of these habits or to their successful completion.

CONTRAINDICATIONS FOR USE OF ORAL SCREEN

The oral screen should never be used until the child has been tested for adequacy of nasal function by the dentist or

17. Bliss, Dennis. The mouth screen and its use in orthodontics. New Zealand D.J. 39:240 April 1943.

18. Nove, A. A. Cirvico-facial orthopaedia. D. Record 66:25 Feb. 1946.

19. Caseley, Rosamond. Principles and construction of the oral screen as a functional appliance. D. Record 67:230 Oct. 1947.

20. Sclare, R. Habits and the orthodontist. D. Mag. & Oral Topics 66:10 Feb. 1949.

21. Day, A. J. W.; Trotter, P. A., and Norris, N. A modified oral screen made of latex. Brit. D.J. 87:143 Sept. 16, 1949.

22. Darby, Frank B. In Report of the clinics, N.Y. Dental College. D. Cosmos 32:214 March 1890.

23. Newell, Harman. Appliance for the prevention of mouth-breathing. D. Cosmos 55:456 April 1913.

24. Gromme, E. J. Simple device to aid in the correction of mouth-breathing. Angle Orthodont. 10:221 Oct. 1940.

25. Robertson, T. M. Fabricating appliances with electric spot welder. Am. J. Orthodont. & Oral Surg. 32:281 May 1946.

26. Brauer, J. C., and others. Dentistry for children, ed. 2. Philadelphia, Blakiston Co., 1947, p. 143-144.

27. Moore, G. R. Editorial comment on Modified oral screen made of latex. In Year book of dentistry 1950. Chicago, Year Book Publishers, 1950, p. 271-273.

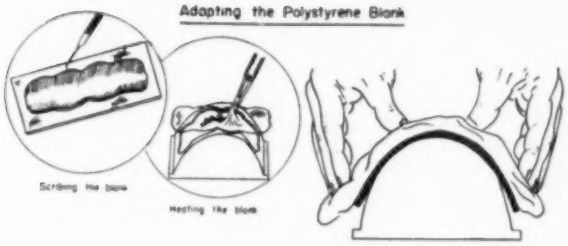


Fig. 10 • Adapting polystyrene blank

the rhinologist. Consultation with the latter is desirable in all cases.

The oral screen usually is contraindicated in children who are unable to cooperate; that is, children under three years of age and mentally deficient children.

The oral screen is not indicated at any age if for any reason it is not wanted by the child, for the efficacy of this appliance rests largely on the acceptance by the patient as well as on his active cooperation.

CONSTRUCTION OF A PLASTIC ORAL SCREEN

The following technic is a method of constructing an effective oral screen from polystyrene in less than an hour. It involves a minimum of material and cost, and a maximum of efficiency, esthetics, and cleanliness.

Casts • Full-mouth casts are required for the construction of the oral screen. They will not be injured and can be kept for a permanent record of the progress of the patient.

Wax Pattern • The casts are placed, in occlusion, on their posterior bases with the anterior segments upward. If the upper incisors are protruded, the lower cast is moved anteriorly until the incisor segments are in correct relationship. The molars usually will be moved from a Class II to a Class I relation (Fig. 7).

A piece of pink baseplate wax is softened in warm water, laid over the cast and trimmed (Fig. 8).

The periphery of the baseplate is trimmed so that the edge reaches the mucobuccal fold in the closed-mouth position. During sleep the teeth are apart and the periphery of the oral screen will reach only to the mucogingival junction and will not impinge on the delicate oral mucosa. Under-extension of the periphery will allow it to slip out of the mouth during sleep, especially in children with vigorous tongue-thrusting habits.

A deep notch is cut for the upper and lower labial frena in the central incisor and cuspid areas. The posterior border is carried to about the first molar area and all edges are rounded. A wax handle is attached to the center of the wax pattern (Fig. 9).

Working Model • The wax is chilled thoroughly to avoid distortion and the wax pattern is removed from the cast. It is held by the handle and the inner aspect is filled with a fast-setting plaster (Fig. 9). Then it is placed in a boxed mix of plaster on a glass slab and is allowed to set (Fig. 9). The wax pattern is removed and the working model is examined carefully. All areas are checked to make sure that only the areas to be contacted by the oral screen show on the working model.

Material • The material used in the construction of the oral screen is a sheet or strip of polystyrene ⅛ or 3/16 inch thick. Polystyrene is a low-heat thermoplastic and softens readily over a Bunsen flame. It can be obtained from any local plastic material supply house in small sheets at moderate cost.

Polystyrene Blank • The original pink wax pattern is softened in warm water, straightened out and laid flat on a sheet of polystyrene. The outline of the wax pattern is scribed on the polystyrene blank with a sharp instrument (Fig. 10). The outline then can be easily cut out in the plastic material with a Jo-dandy disk. If preferred, the sheet of polystyrene can be softened to a rubberlike consistency over a Bunsen flame and the pattern cut out with ordinary scissors.

Adaptation • The polystyrene blank is heated gently over a Bunsen flame to a rubberlike consistency and is placed over the working model (Fig. 10). Then the blank is heated evenly and gently with an inverted Bunsen flame until it softens sufficiently to mold over the cast. The material must not be overheated since it can burn. A towel is placed over the softened polystyrene which is adapted with the fingers to the cast (Fig. 10). A constant pressure is kept on the oral screen until the polystyrene cools and hardens. It may be reheated if necessary for more perfect adaptation.

The material hardens quickly and the edges are easily polished on a rag wheel. It is hard and clean and will not absorb moisture.

Action on Upper Anterior Teeth • The exact adaptation of the oral screen to the cast depends entirely on the purpose of the screen. It must never be adapted too closely to the free gingiva or the lower anterior teeth but should lie free from these areas.

If no malocclusion exists and the oral screen is to be used passively to prevent mouth breathing at night, only the periphery of the screen should rest on the attached gingiva (Fig. 11). It should not rest on the teeth at all. The working model therefore should show no impression of the teeth.

If the upper incisors are protruded and diastemas exist between these teeth, the oral screen should bear primarily on those teeth which should be moved lingually (Fig. 11). This is accomplished by pressing the wax pattern firmly over the teeth to be moved so that the working model shows the upper incisors boldly and the other teeth not at all. Another method is to relieve the working model at the areas where pressure is desired. The models should be placed in a corrected (Class I) molar relation before the wax pattern is made so that the excessive anterior overjet is eliminated in the oral screen (Fig. 7).

The exact areas of contact are checked as well as the amount of pressure in the mouth. This is easily accomplished through the clear plastic (Fig. 11).

Instructions to the Patient • The patient is instructed to wear the oral screen for three successive nights. He is advised that it undoubtedly will be uncomfortable the first night and he should be told to come in for an immediate adjustment if sore spots develop. If there is no difficulty, the patient should return in three days for a check-up and for minor adjustment of the appliance.

The oral screen is a clean, simple device with definite advantages as a pedodontic and orthodontic appliance. It is inexpensive to fabricate and can be used for a number of purposes. The oral screen offers a convenient transfer mechanism for the correction of noxious oral habits. It is physiologic in its action and therefore cannot be misused readily.

Deep Breathing and Lip Exercises • Deep breathing and lip exercises are

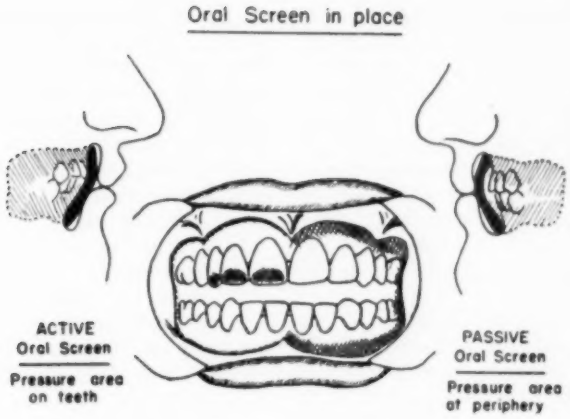


Fig. 11 • Oral screen in place. Note pressure areas on teeth in active screen and peripheral pressure area in passive screen

useful as daytime supplements to the oral screen which is worn only at night. Deep breathing exercises help considerably in the restoration of nasal breathing and the elimination of habitual mouth breathing. The lip exercises facilitate the retrusion of protruded upper incisors. A finger device can be added to the oral screen to enable the child to exercise the labial musculature and thus increase muscle tonus.[28, 29]

28. Salzmann, J. A. The prevention and interception of malocclusion. Am. J. Orthodont. 34:732 Sept. 1948.
29. Salzmann, J. A. Principles of orthodontics, ed. 2. Philadelphia, J. B. Lippincott Co., 1950, p. 664-667.

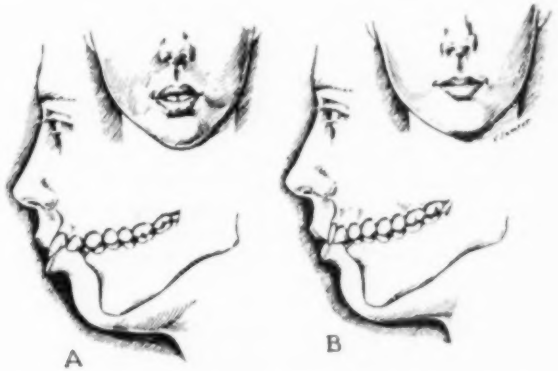


Fig. 12 • Correction of protruded upper incisors and restoration of normal labial tonus plus lip seal after use of active oral screen, supplemented by lip exercises, for three months (B). (Drawn from photographs and models of actual patients)

DEEP BREATHING EXERCISES

The following breathing exercises may be performed for the first week: The child breathes deeply, with lips tightly closed, in front of an open window, for a full five minutes, five times per day (on arising, 10 A.M., noon, 3 P.M., evening). The parent counts, "In-two-three-four, Out-two-three," in order to encourage and help the child to perform the exercise regularly.

During the second week, the child can jump rope in front of the open window for the same length of time in order to increase forceful breathing and to make a game of the exercise. The patient is instructed to "squeeze the lips tightly" while jumping rope and to stop jumping rope when nasal breathing becomes impossible.

These exercises, if performed regularly and for some time, aid greatly in the restoration of nasal breathing during the daytime.

LIP EXERCISES

A narrow active oral screen which rests only on the upper incisors can be constructed for daytime use which can be worn by the child during the deep breathing exercises, if it is desired that retrusion of the incisors be accelerated. The screen is narrow since the teeth are in occlusion and it rests entirely on the protruded upper incisors. It should not rest on the mucosa at all. The child is instructed to compress the lips tightly against the screen while doing the breathing exercises.

Other aids in exercising the lips have been suggested by a number of authors, such as using a mouth rinse, maneuvering a piece of heavy paper,[21] blowing a pencil or feather off a table,[21] holding a flattened metal strip between the lips,[30] and playing wind instruments.[31, 32] All these methods are directed to developing normal lip tonus and to establishing proper lip seal (Fig. 12).

CORRECTION OF THE EFFECTS

The importance of re-establishing lip seal by suitable lip exercises cannot be overemphasized. It frequently is necessary, however, to correct the Class II, Division 1, malocclusion with orthodontic treatment before proper lip seal is made possible. In these instances lip exercises are a valuable supplement to orthodontic treatment. When proper lip seal becomes possible, mouth breathing often ends.

When the child returns to normal nasal breathing with the assistance of the oral screen, the hypertrophic gingivitis soon disappears. The mucosa again becomes moist and regains its normal appearance. The return to normal breathing also often leads to a considerable improvement in the child's general health. It is a common clinical impression that the incidence and severity of respiratory infections are decreased.

SUMMARY AND CONCLUSIONS

1. Obstructive mouth breathing is the result of an anatomic predisposition (narrow airway), and local nasal or pharyngeal obstructions. Habitual mouth breathing results from the tendency to continue mouth breathing in narrow-faced individuals even after the nasopharyngeal obstructions have been removed.

2. Mouth breathing may predispose the child to respiratory infections, to hypertrophic gingivitis and to increased incidence of dental caries. The mouth breathing may accentuate and aggravate but probably does not cause a Class II, Division 1 malocclusion.

30. Colyer, J. F., and Sprawson, E. C. Dental surgery and pathology, ed. 7. New York, Longmans, Green & Co., 1938, p. 256.

31. Summa, Richard. A new method for the correction of stubborn types of mouth-breathing. Int. J. Orthodont., Oral Surg. & Rad. 18:843 Aug. 1932.

32. Gustat, Joseph. Muscle training and development of respiration as taught by musical wind instrumentalists. Int. J. Orthodont., Oral Surg. & Rad. 18:846 Aug. 1932.

3. It is important to test for nasal and oral breathing to determine directly the type (obstructive or habitual) and degree of mouth breathing (partial or total, continuous or intermittent).

4. Treatment of mouth breathing is the joint concern of the pediatrician, the rhinologist, the orthodontist and the pedodontist. Each child should have a complete pediatric appraisal. Actual treatment is divided into three parts: removal of the nasal or pharyngeal obstructions by surgery or appropriate medication by the rhinologist; interception of the habit with an oral screen by the pedodontist; and correction of the malocclusion by the orthodontist.

The prosthodontist and the temporomandibular joint syndrome

Louis S. Block, D.D.S., Louisville, Ky.

From the viewpoint of the clinician and especially of the prosthodontist there is need today for further study and a greater appreciation of the problems involved in temporomandibular joint cases. For the purpose of simplification, the various manifestations of temporomandibular joint syndromes may be classified into two groups. The symptoms in the first group include pain in chewing; crepitus within the temporomandibular joint; and referred neuralgic pains radiating and extending into the ear, side of the face, back of the neck, and even into the shoulder. The degree of pain varies with the patient and with the extent of injury or degeneration within the joint. The second group consists of symptoms relating to changes which affect the eustachian tubes, such as stopped-up sensations in the ears or tinnitus.

The first practitioner whom the patient consults is the otolaryngologist or the medical internist and but rarely the dentist. Gradually, however, the public is being educated to the idea of connecting these symptoms with need for care by a dentist; and as the years pass, more patients will go directly to the dentist. It is possible that it is not entirely desirable that the patient should consult the dentist first, for if a completely competent and honest service is to be rendered, it would perhaps be as well for the otolaryngologist to rule out ear pathology before the dentist begins treatment, particularly if the symptoms of the patient are connected with the eustachian tubes.

Presented before the Section on Complete Prosthodontics, ninety-third annual session of the American Dental Association, St. Louis, September 9, 1952.

It may be to the patient's advantage to have the otolaryngologist participate in the diagnosis and the prognosis.

Frequently the dentist is the third or the fourth practitioner whom the patient suffering from a temporomandibular joint disturbance has consulted. Such a patient is usually exasperated and worn out with appointments in one office after another. The delay may have been beneficial, however, as by the time the dentist sees the patient, a differential diagnosis may have been made. A physician may have referred the patient to an oral surgeon. One or the other may have asked a roentgenologist to provide views of the temporomandibular joint and may have added to the confusion by placing the roentgenologist in the embarrassing position of having to interpret roentgenograms without knowing what position of the mandible was desired. In any case, the two or three practitioners who have already examined the patient may have ruled out pathology with similar and confusing symptoms, so that the prosthetist is in a position to see the problem clearly.

These statements are not intended to imply that temporomandibular joint syndromes are not the problem of the physician, the oral surgeon or the roentgenologist but rather to indicate that all practitioners should cooperate in forming a differential diagnosis. It must be recognized, nevertheless, that it is the dentist who must do the actual corrective work, that therefore he should be the focal point around which services revolve and that he should be consulted in advance.

CONTRIBUTION OF THE ROENTGENOLOGIST

The treatment of the patient with temporomandibular joint disturbance might well be planned by a panel of practitioners. The contribution of the roentgenologist to that panel would consist of roentgenograms showing the temporomandibular joint surfaces, the condyle and the articular eminence. Evidences of erosion or changes in surfaces, when the remainder of the osseous structures appear normal, usually indicate occlusal disharmonies which have caused shifting of the mandible. On the basis of the information supplied by the roentgenologist, the prosthodontist can equalize the pull on the mandible by removal of dental interferences either by selective grinding or by extraction and thus allow the muscles to return to a normal state of equilibrium. In time, the bony surface will be regenerated and a normal contour will be restored.

If occlusal abnormalities or trismus of the muscles have pulled the mandible into a strained retruded position and the condyle is revealed by roentgenograms to be forced back against the anterior tympanic plate, the roentgenologist should provide additional roentgenograms taken with the mandible in an open or in a protrusive position and with the condyle forward. In case of extreme pain and trismus resulting from inflammation within the joint, it may be necessary to administer an anodyne or a sedative to the patient and to apply hot packs in order to avoid great discomfort to the patient during the taking of the films. Above all, before the roentgenograms are taken, the roentgenologist and the prosthetist should agree on the position of the mandible to be shown in the roentgenogram.

For arthritic patients, roentgenograms showing heavy mineralization and sometimes definite changes in joint surfaces are valuable as a guide in treatment. Since the arthritic joint cannot be treated as a normal one, the prosthodontist must consider carefully the condition of the joint when he is obtaining maxillary records for denture construction.

There are some competent dentists who place great faith and confidence in their ability to diagnose delicate occlusal disharmonies from roentgenographic studies of the temporomandibular joint.

Some use stereoscopic views and some the cephalometer. Such studies are not reliable enough for treatment planning to be based on them; rather the prosthetist should depend chiefly on the clinical picture, correlating studies of the mouth, rest position, dental arrangement, muscles and physical and mental condition of the patient. There is no doubt that the roentgenologist can be of valuable assistance to the prosthodontist in the study of the temporomandibular joint, especially if both practitioners are willing to cooperate for the best treatment of the patient.

CONTRIBUTION OF THE ORAL SURGEON

Likewise, the prosthodontist and the oral surgeon working in harmony have an opportunity to serve the patient suffering from temporomandibular joint disturbance. The author has a vivid recollection of one case in which an oral surgeon could have been helpful. A middle-aged woman was referred by a medical internist who was disturbed that the patient's jaws had been wired together. There was no history of accident or of fracture. The physician had removed the wire and had sent the patient to the author for orthodontic treatment. The clinical history, typical of the painful type of temporomandibular joint disorder, revealed tenderness over the left temporomandibular joint, limitations of movement, and pain during chewing. In the roentgenograms of the joints and of the teeth, however, the joints appeared normal, although the lower left first and second molars showed deep caries, pulp exposures and extended periapical involvement. It is apparent from this case that no angle in study and diagnosis should be overlooked.

Lower third molars if erupting or partially erupted in crowded areas frequently cause anterior tipping of the second molar. The distal cusp of the second molar is consequently forced into supraocclusion. A premature contact results and serves as a tipping point or fulcrum on which the mandible rocks during function. With time and wear an inclined plane may develop and force the mandible into an eccentric position while closing. If an oral surgeon is consulted about the painful type of temporomandibular joint disturbance, it is always good practice for him to consider all possible occlusal problems which can arise from erupting third molars.

In extracting lower molars when removal of considerable osseous structure is involved, the careful oral surgeon is extremely conservative in his use of a mallet and chisel. Unless support is provided at the angle of the jaw when the malleting is done, the downward and backward stretch which such a force exerts on the ligaments and structures around the joint can cause damage to the area as well as symptoms typical of temporomandibular joint disorder. The patient or the nurse can usually be depended on to provide the necessary support.

COMMENT

There is no branch of dentistry which does not have some relationship to occlusal health. In the dental literature there are countless articles dealing with the influence of malocclusion on the temporomandibular joint; attention is called to the danger of establishing premature contacts and thus of forcing the patient's jaws into eccentric positions. All dentists, specialists and general practitioners alike, must assume their responsibility as guardians of dental and oral welfare.

Too often dentists are hasty in their examinations and their studies of dental problems. The periodontist demonstrates how regeneration of supporting tissue occurs and how teeth become firm after occlusal disharmonies are removed. Should not the oral surgeon also under-

stand and practice the establishment of proper centric jaw relations before condemning some shaky and questionable teeth? Sometimes a prosthodontist is in a position between that of the periodontist who may be inclined to go to extremes to save a tooth and that of the exodontist whose inclination is to remove the tooth. Slow, careful and deliberate study, the judgment which comes with years of experience, an open mind and a sincere interest in the patient's welfare will enable a practitioner to render the best service possible and cause him a minimum of pangs of conscience and sleepless nights. All members of the profession can learn from each other, and indeed there is a great deal to learn.

Thus, the prosthodontist, reflecting on the temporomandibular joint syndome, sees the need for cooperation among all practitioners who treat the patient and especially on the part of the roentgenologist, the oral surgeon and the prosthodontist.

Starks Building

The Fédération Dentaire Internationale

Oren A. Oliver, D.D.S., LL.D., Nashville, Tenn.

The Fédération Dentaire Internationale, commonly designated as the F.D.I., is a permanent world association of national dental societies. Its central government administers international affairs, but each component association retains its independence in local dental affairs.

The Fédération has as its functions:

1. The promotion of International Dental Congresses at regular intervals of five years.
2. The maintenance and strengthening of the bonds of fellowship between national dental societies.
3. The general encouragement of any activity that the organization may regard as contributing to dental science.
4. The collection and collation of scientific data in the dental field.
5. The awarding of the "Miller Prize" and other international awards.
6. The publication of an international dental journal.
7. The collection of professional documents with the hope of the eventual establishment of dental documentary centers throughout the world.

The long-range objective of the F.D.I. is the attainment of the highest possible level of dental health for all people of the world. All great international organizations seem to possess in common the following characteristics:

1. The original concept of the organization arises through the inspiration of one mind and not as the result of committee deliberation.
2. The time and moment of organization are favorable for the germination of the seed which the originator is endeavoring to plant.
3. The concept is realistic and not simply visionary.

President, Fédération Dentaire Internationale, and chairman, Council on International Relations, American Dental Association.

4. The organization can function.

5. The ideal of the organization is directed toward a goal which has a universal appeal for all men of good will, irrespective of race, politics or religion.

These are the fundamental characteristics of the Red Cross of Geneva, the International Rotary and the Fédération Dentaire Internationale. The Fédération Dentaire Internationale is indissolubly bound up with the history of the dental profession. Its own history can be presented as a serial story with each chapter ending in an International Dental Congress. Chapter XI, the most recent, was written in London last July. This Congress, a perfect example of a realistic world conference, was considered the finest held to date.

The first three congresses, held in Paris in 1889, in Chicago in 1893 and in Paris in 1900, were timed to coincide with great international expositions. Although all, especially the third, were highly successful, the fact that dentistry was presented independently of the other sciences did not satisfy the members of the organizing committees.

Charles Godon, president of the Third International Dental Congress and a natural leader, appreciated the powerful influence that these international dental meetings could have on the progress of dentistry. The idea proposed by Dr. Godon, received with enthusiasm by the 1,200 dentists representing the principal dental societies of several countries of the world, resulted in the creation of the F.D.I., which was inaugurated August 4, 1900, in Paris.

The members of the newly formed organization soon found that they had more to do than to arrange for the next International Dental Congress. They were faced with the gigantic problem of supplying dental education to a not overly-interested public and dental service to countless needy people throughout the world. The first two committees appointed were the Committee on Education and the Committee on Public Dental Hygiene. The latter committee later became the Committee on Public Dental Service. The fact that the first committees appointed were charged with the responsibilities of education and service is extremely significant and, no doubt, explains the astonishing vitality of the F.D.I. The aspiration for universal dental education and dental care for the poor has permeated permanently the entire structure of the organization. Every meeting, every presidential address, has reflected this practical idealism.

Except for the Red Cross of Geneva the only international health organization to stand firm and unshaken during the two world wars was the Fédération Dentaire Internationale. The F.D.I., in its own sphere, has attained the goal for which the United Nations Organization is so earnestly striving and which the League of Nations failed to reach.

Dr. Godon and his colleagues built the organization on a sound psychological foundation, one which has led to peaceful international cooperation. Such cooperation is inevitable because the organization was imbued with two basic impulses: a desire to serve creatively and an impulse to sacrifice self in the interest of others.

In order to appreciate fully the objectives and accomplishments of the Fédération Dentaire Internationale, a brief commentary on the origin and history of dentistry is in order. In the eighteenth century France was supreme in the art of dentistry. Pierre Fauchard, who published the first complete book on dentistry in 1728, is recognized as the father of modern dental practice. He is to dentistry what Hippocrates is to medicine. About the time of the War of Independence, or shortly before, French surgeons introduced the dentistry of Fauchard to the colonists of this country. Thereafter the technic continued to be improved with the result that in 1840 Horace H. Hayden and Chapin A. Harris, two prominent

dental leaders of postrevolutionary times, founded the Baltimore College of Dental Surgery, which was authorized to grant its graduates a degree of D.D.S. Slowly and methodically through the raising of the standards of education, examination and licensure, America became supreme in the art and science of dentistry. The rapid progress and improvement made by dentistry enabled it to develop as a separate branch of the health services and to establish safeguards to protect the public from the charlatan, the quack and the unqualified practitioner.

In France the fate of dentistry was different. One of the acts of the fanatics of the French Revolution was to remove all control from the practice of the professions. In 1795 the medical schools were reopened; in 1802 the regulations concerning the practice of medicine and surgery were reimposed. Some authorities claimed that dentistry was a specialty of medicine and could be practiced safely only by a stomatologist possessing a full medical degree. Others did not agree. For 100 years (1792-1892) no definite legal provisions existed for the dental profession in France. The tension between the odontologists, or practitioners with only dental training, and the stomatologists, or practitioners of dentistry with a medical degree, was particularly acute in France and Belgium and to a lesser degree in Holland. Dentistry in the Scandinavian countries, Switzerland and Germany did not experience great difficulties; but in Italy, Austria, Hungary and some of the other European countries a full medical course plus special training in dentistry was favored for the dental practitioner.

British dentistry has occupied a unique position since the time of John Hunter, the celebrated pathologist and surgeon. After 1856 the Royal College of Surgeons issued licenses to practice dentistry in Britain. By the middle of the nineteenth century the dental profession was divided into two groups: the memorialists who desired that the Royal College of Surgeons issue dental licenses and the independents who wished to retain the control of dentistry in the dental profession. Both groups later were admitted to the British Dental Association.

Strictly speaking, any official meeting of the Fédération Dentaire Internationale for which a general assembly is convened may be termed a Congress. A distinction must be made, however, between annual sessions of the permanent organizing body and the larger meetings held every five years; the latter is distinguished as an International Dental Congress.

The span of years between 1901 and 1914 can be called the first functional period of the F.D.I. During that period 13 of the 14 annual sessions were held in Europe. The contribution by members from the United States has been motivated entirely by a desire to help the organization become truly international in character. For that reason American members have never insisted that the privileges in the F.D.I. be gauged by the numerical size of the participating national dental societies.

Preparations for the 1914 Congress included the appointment of the following committees: (1) military and dental service, (2) history of dentistry, (3) international dental press, (4) terminology and (5) jurisprudence and dental ethics.

The period from 1921 to 1939 may be designated as the second functional period of the F.D.I. In 1921, after World War I, representatives of the invaded countries of Europe generously agreed to abandon all manifestations of war hate and to work for the spirit of peace among all nations. The F.D.I. was the first international organization to resume its regular routine activities after the war, and it held an unbroken series of annual meetings for the next 18 years. This second period possibly was even more dependent on a few outstanding personalities than was the period prior to the war. During this period the organization was fortunate to

have as its presidents such strong personalities as Truman W. Brophy, Florestán Aguilar, Georges Villain, W. H. G. Logan and A. E. Rowlett.

The third functional period followed World War II. Dr. Rowlett of England was elected president in 1946. He had served in that capacity since the death of Dr. Logan. Steps were taken to hold a Congress in Boston in 1947 and to hold the 1952 Congress in London should an official invitation be received from the British Dental Association. The period since 1948 has been the most outstanding in the history of the F.D.I. During those short years the organization emerged into a true federation of national dental associations. It now typifies in objectives and administration the ideal international organization envisioned by its founders. It stimulates the creative abilities of minority groups and encourages the individual to work unhampered in a nongovernmental international organization the sole objective of which is the improvement of mankind.

The most recent International Dental Congress—the eleventh—was held in London in July 1952. Most participants pronounced it one of the best meetings they ever attended. It was held in the Royal Festival Hall, a magnificent structure, built for the 1951 Festival of Britain. The Congress was efficiently organized, the handicaps of multiple languages were minimized, the scientific program was excellent, and the social program was attended with the magnificence that is traditionally British. More than 75 different governmental units were represented, and more than 800 dentists from the United States attended.

Now that the German and Japanese dental associations have been readmitted to the Federation and now that the House of Delegates of the American Dental Association has decided to recognize the Federation by joining as an affiliated member, the future of this great international dental organization appears to be assured. Since the statutes and rules of the F.D.I. have been revised to conform to modern thought and to precepts of the World Health Organization, the year 1953 may be referred to as marking the beginning of the fourth functional period of the organization.

The Fédération Dentaire Internationale is a perfect pattern for a true international congress. The objective of the Congress held in London last year was focused on dental health. This is a practical as well as an idealistic objective which every nation, irrespective of race, creed or politics, can endorse and emulate.

There still is much ignorance, superstition, apathy and fear lodged in the minds of men throughout the world. There is much to be done in every country to wipe out that ignorance, dislodge that superstition and dispel that fear. There is much to be done to solve specific problems of different nations and to overcome specific difficulties of different peoples. It is axiomatic that the mutual sharing of problems makes the task mutually beneficial. It is equally true that international good will and brotherhood are desired by the majority of people, irrespective of their geographical location.

Although the profession of dentistry is young as compared to the age of other sciences, it has much to contribute to international good will and progress; it is willing and anxious to make its full contribution. The Fédération Dentaire Internationale, in its particular sphere of activity, can help forge the links which bind nations and men together. The Federation is playing and will continue to play an important role in improving the health standards of the world by improving the dental fitness of its citizens. This aspiration alone is sufficient justification for the continuance of a dental federation dedicated to raising the health standards of mankind.

1915 Broadway

Report on the Ninth Congress on Dental Education and Licensure

Since 1941, the Council on Dental Education has been sponsoring conferences designed for dental examiners and dental educators. These conferences or congresses have afforded the representatives of these two groups an opportunity to present their common problems and to discuss the solutions to these problems.

The Ninth Congress on Dental Education and Licensure was held in Chicago at the Conrad Hilton Hotel on February 7, 1953, and was attended by about 55 examiners, 110 dental educators, 20 practitioners and 40 visitors. This was the largest attendance in the history of these congresses which emphasizes the interest that now exists in problems related to licensure, methods of teaching, admission of students, and qualifications of dental specialists.

The Council's committee for planning the Ninth Congress consisted of Bert L. Hooper, chairman, Robert W. McNulty, B. M. Tylicki, Eugene R. Westcott and Shailer Peterson. The morning session was devoted to a discussion of admissions requirements of the dental schools, a topic which is of immediate interest to all dental school administrators and teachers, and of indirect interest to the dental examiners, many of whom must consider predental requirements in evaluating the eligibility of their candidates for licensure. John E. Buhler, dean of the School of Dentistry of Emory University, was moderator of the morning session and his panel consisted of Berton E. Anderson, George R. Moon, Rev. William D. O'Leary and Wendell L. Wylie.

The questions discussed at the morning session were as follows:

1. What is the relative importance of the two year or the three year predental requirements?
2. What role does biology play in preparing a student for dental school and should it be required?
3. What roles do such courses as inorganic chemistry, organic chemistry, and physics play in preparing students for dental study and should these courses be required?
4. Should courses other than English, chemistry, physics and biology be required of all students who are admitted to dental school?
5. Is evidence of superior scholarship sufficiently important as a predictor of dental school achievement that the superior student should not be required to take all of the courses normally required of average students?
6. Of what value is the personal interview in the admission of dental students?
7. Of what value are letters of recommendation when selecting students for dental school?
8. What limitations must the admissions officer place upon the credentials received from institutions known to have different standards for their grading systems?

The afternoon session was devoted to various problems associated with the recognition of dental specialties and the educational training required by the specialty boards. This is a topic which is of direct interest to the eight states that license dental specialists and to all of the

Table 1 • Tabulation of replies received on Opinionnaires from persons who attended the morning session of the Ninth Congress

	Yes	No	No answer
	%	%	%
1. Should each of the following predental college subjects be required of *all* students eligible for admission to dental school?			
(a) English	98	1	1
(b) Biology	93	1	6
(c) Inorganic chemistry	94	3	3
(d) Organic chemistry	94	3	3
(e) Physics	91	8	1
2. Is the demonstrated quality of predental college work more important than the quantity or amount of predental study when considering a dental applicant for admission?	83	3	14
3. Should a school require personal interviews of all applicants?	74	14	12
4. Is the personal interview of equal or greater importance in comparison with such data as college transcripts and aptitude test scores?	43	43	14
5. Are cultural values and benefits the major reason for requiring predental college courses?	31	51	18
6. Are aptitude test scores of equal or greater value than predental college grades in the majority of instances?	40	51	9
7. Should all dental schools have the same minimum standards for admission?	81	16	3
8. Should all dental schools have identical standards and requirements for graduation?	40	47	13

state boards in which dentists are announcing themselves as specialists by virtue of limitation of practice or by virtue of being diplomates of dental specialty boards. Both the licensure boards and the schools must concern themselves with the definition of a specialty and with the advanced educational programs which are being established in many institutions.

Allan G. Brodie, dean of the College of Dentistry of the University of Illinois and a diplomate of the American Board of Orthodontics, was moderator of the afternoon session and his panel consisted of Paul E. Boyle, Irving R. Hardy, Ralph L. Ireland and William A. Jordan.

The Council on Dental Education is concerned with the problem of admission of students to dental schools. It is also interested in a clarification of the definition of a dental specialist and in restudying the educational requirements of the specialty boards. Therefore the Council looks to the Ninth Congress, as it has to previous congresses, for guidance and advice in its study of these various problems. It is also of interest to note that the Council now plans to hold a workship in the Fall of 1953 for further study of the educational programs designed to serve the specialty boards. This workshop will extend the discussion of the specialty board

Table 2 • Tabulation of replies received on Opinionnaires from persons who attended the afternoon session of the Ninth Congress

	Yes	No	No answer
	%	%	%
1. Should dentistry attempt to have specialties in more than seven areas?	19	71	10
2. Should the length of the required educational training at the advanced level be the same for all specialties?	7	86	7
3. Should the undergraduate program of the dental schools be modified to give increasing attention to the education of dental specialties?	27	69	4
4. Should dental internships and/or residencies be required for all dental specialists?	33	56	11

problems considered at the Ninth Congress, provide specific recommendations for the present seven specialty boards, and provide further definitive statements which will prove useful to the groups that are now seeking to have their fields recognized as dental specialties.

Attention should be drawn to the fact that at this congress, Opinionnaires were distributed to the audience at both the morning and afternoon sessions. The purpose of the forms was two-fold: first, to supply the audience with a list of the important topics scheduled for discussion; and second, to provide members of the audience with an opportunity to indicate their opinions and conclusions relative to these questions. The reports on the tabulations are given in Tables 1 and 2, and comments on these will be found in the presentations prepared by the two moderators.

The Council wishes to express its appreciation to Dr. Buhler and Dr. Brodie, who ably conducted one of the most successful congresses that have been held. Appreciation is also expressed to the panel participants as well as to those in the audience who helped to make this congress a success.

WHAT ADMISSIONS REQUIREMENTS SHOULD BE USED IN DENTAL SCHOOLS

The curricular standards and requirements in dental education over the years have been up-graded following, for the most part, a logical pattern. Educators, examiners and interested practitioners, however, have recognized that inadequacies in the area of admissions were almost directly proportionate to the inabilities to realize fully the benefits of curricular advancements. These admissions inadequacies were principally in two categories: first, an insufficient number of applicants, making reasonable selectivity impossible; and secondly, an almost complete absence of reliable yardsticks with which to measure those aptitudes and capacities that are necessary for the successful completion of the dental curriculum and the achievement of postgraduate professional competence.

During the years preceding World War II, and at a rapidly increasing rate after the war, interest in admissions procedures mounted because of the recognition of the inseparable relationship between the intellectual, digital and other capacities of those admitted to dental study. During the postwar years, probably for the first time in history, the number of applicants for admission to dental schools became sufficiently significant so as to make reasonable selectivity possible. Fortunately, there were some in education who had long been concerned with devising means of measuring certain of the necessary aptitudes. With the increase in the number of applications for admission, it became possible to apply these measurements that had been learned during prior years. That these adjuncts have been useful is borne out by the records of prediction and accomplishment as reported periodically by Shailer Peterson, secretary of the Council on Dental Education, and by the admissions officers and testing directors in many of the dental schools.

Since there is now an accumulation of experience on the part of the schools and since rational and carefully devised aptitude tests have been employed, the Council sponsored, as a part of its Ninth Congress on Dental Education and Licensure, a symposium on "What Admissions Requirements Should Be Used in Dental Schools?" A panel of four persons prominent in the fields of higher education and

dental education, together with eight audience participants—a group representing examiners, practitioners and educators—were invited to introduce discussions and to report on their own observations. In addition, there was discussion by an unusual number of well qualified persons in the audience.

The Council employed a unique procedure in soliciting opinions from the audience by distributing an "Opinionnaire" and a list of eight pertinent questions. Those in attendance cooperated well and the results will be helpful to the Council, to the schools and to the examiners. The eight questions are included in the introductory statement, and the "Opinionnaire" with the percentage distribution of the replies are shown in Table 1.

In order to concentrate attention on but a few of the factors which have a bearing on the topic of admissions requirements and the objectives, the panel attempted to restrict themselves to 12 questions on specific items. The context of these questions is sufficiently similar to that of the questions already listed so that they need not be included here.

The interest which the audience demonstrated through their lively discussion of the first few questions made it apparent that an attempt to curtail discussion on any one of these would be unfair. Hence, broader examinations were made of a few of the topics in lieu of the more superficial treatment which would have been necessary if several additional topics were covered. It was generally agreed that the subject of admissions procedures was so great and so important that full justice could not be achieved during a one-morning session. It is to be hoped, therefore, that the Council may find ways and means of sponsoring additional sessions on this subject under equally favorable circumstances, with participation by examiners, practitioners, educators and testing experts.

In the course of the discussion, no unanimity was found regarding the relative importance of the two year as against the three year preprofessional requirement. In either requirement, it was agreed that the quality of the collegiate performance was the most important factor, and that by contrast the acquiring of a baccalaureate degree to meet a requirement was meaningless. It was brought out that the requirement of three years imposed an additional year during which the candidate might reasonably be expected to develop greater intellectual maturity and greater maturity of purpose; the schools' experiences with the more mature veteran students were recalled as a measure of proof of this thesis. The desirability of developing educational background for "the whole man," particularly background in the humanities and social sciences as a complement to the rigidly scientific channels to which his professional education must restrict him, was advanced as one of the strongest arguments in favor of more extended periods of preprofessional education. This indicated recognition of the objective of producing a professional man with social, cultural and intellectual interests compatible with the position which he should be willing, able and anxious to assume in his community. Other opinions favoring periods longer than two years of arts and sciences study were justified on the basis that such periods provided opportunity for the development of the "scientific approach."

In addition to these arguments favoring three years or more of preprofessional collegiate studies, there were some equally valid opinions expressed in favor of the two year minimum requirement. It was pointed out that the schools are at the moment successfully educating and sending into practice, teaching and research activities, at the highest level of competence, dental graduates who have completed only the two year pre-

professional minimum; that the quality of achievement in the collegiate subjects, the intellectual capacities of the student and the nature and extent of his interest, motivation and social consciousness are factors of greater importance than exposure to and satisfactory completion of collegiate subjects other than those which are possible within the two year minimum.

It was also observed that in light of the many significant advances which have been made in the field of dentistry and the related sciences during the past decade, it is becoming increasingly evident that if undergraduate education is to keep pace with this additional knowledge, another year undoubtedly will have to be superimposed on the standard four year undergraduate curriculum. If such should be the case, then not only are the schools obligated to keep abreast of newer knowledge and developments, but they must recognize the economic implications of whatever new requirements may be adopted and must weigh these carefully against the improved social and health benefits which they expect will be derived. To add more, quantitatively, to the preprofessional requirement might reasonably be expected to mitigate advancements in the professional field itself.

As to whether all candidates for admission should be required to have completed courses in English, biology, inorganic and organic chemistry and physics, there seemed to be virtually no disagreement, particularly in principle. A question was raised regarding the precise nature of the contribution which some college courses in biology contribute to the students' ability to pursue satisfactorily the biological courses in the dental curriculum. The thought was advanced that intellectually competent students would very likely be able to make equally satisfactory progress and, at the same time, be more rounded in their experience and cultural appreciation if courses in literature, history or the social sciences could be allowed to replace these inadequate courses in biology.

Several sharp criticisms were made of the courses in English composition and rhetoric offered by so many of the colleges. Because of the inadequacy and ineffectiveness of these courses, the dental schools have been compelled to include courses in technical composition in their own curricula in order to be assured that dental students might be able to meet minimal standards of competence in effective writing. The panel and audience seemed to be in agreement on these criticisms and on the further point that the development of the art of communication is the most vital factor in any area of education. It was agreed that the colleges should be urged to increase their endeavors directed at greater effectiveness in the area of composition and rhetoric. That those in attendance felt strongly on this point is borne out by the results tabulated on the "Opinionnaire." Attention is directed to the fact that 98 per cent of the returns indicate English to be an important subject in the preprofessional curriculum—this question was the only one on which there was such a high percentage of agreement.

Some of the interesting discussions were on the value of personal interviews in admissions procedures. It was agreed that factors of personal appearance, physical defects and possibly state of health could be appraised at a personal interview, but it was agreed also that the state of health and the existence and evaluation of possible physical defects could be appraised through other means than an interview. There was unanimity on the desirability of employing any procedure which would elicit information on the important point of motivation. Some of the discussants suggested that it was possible, through the medium of the interview, to appraise motivation with reasonable satisfaction. The mod-

erator was impelled to take the license of injecting the personal opinion of doubting that many, if any, humans possess the psychic capacity of measuring motivation or interest under the conditions in which personal interviews generally are conducted. The question was asked, "Excluding physical defects, how many applicants for admission to the 1952 freshman class were not accepted solely on the basis of information derived through personal interviews?" It could not be determined how many, if any, applicants were so affected. One school, in reporting its experience in its efforts to evaluate the personal interview, had admitted its 1952 class without interviews and of the total number, they reported that possibly in two (or 2.5 per cent) of the candidates admitted there might have been a question as to fitness. This evaluation was made after about 20 weeks of continuous faculty contact as contrasted to the limited number of minutes which can be devoted to personal interview.

That the majority of those in attendance were of the opinion that the "merchandise" should be examined before accepting it, in contrast to a "mail-order" procedure, is seemingly borne out by the fact that 74 per cent of them favored an interview while only 14 per cent regarded it as unnecessary and 12 per cent expressed no opinion. The moderator finds it difficult to rationalize the distribution of the answers to Question 4 of the "Opinionnaire." Of those replying, 43 per cent were of the opinion that, as compared with the applicant's ability to cope with the predental collegiate requirements, the scores earned on aptitude tests, or both of these combined, personal interviews alone are of equal or greater value in determining the applicant's ability successfully and competently to achieve the requirements of the dental curriculum and of professional stature.

During the discussions about the relative values of the several aptitude tests included in the battery given under the direction of the Council on Dental Education, the encouragement and help which the Council has given the schools, and most especially the excellent work of its secretary, Dr. Peterson, was acknowledged. These tests were regarded as probably having constituted the strongest single influence in bringing about an over-all improvement in admissions procedures, and in developing an awareness of the reliability of well-devised tests as a means of measuring many of the needed aptitudes.

Reference was made to the unusually high correlations which were recorded during the five-year test period that the Council conducted prior to offering the program on the national basis. Several of the participants reported experiences of unusually high correlations, especially in the tests on carving, object visualization, biology and chemistry. Representatives from two schools where batteries of tests almost identical to the current Council-sponsored battery have been required for three years and two years respectively, prior to the beginning of the program, reported that the correlations of prediction and performance in their schools had been sufficiently high so that the tests had become an invaluable part of their programs. Some of the schools, especially where rigid residency restrictions are in force, understandably could not report as high correlations, and many schools varied in their experiences with the predictive values of individual parts of the battery. In general, great credit was given to the aptitude testing program as an invaluable factor in improving the admissions procedures by giving for the first time a measurable, concrete and tangible adjunct to the only other tangible and measurable factor heretofore available—the preprofessional college record.

The value of letters of recommendation brought out interesting but not par-

ticularly enlightening discussion. No one disagreed with the observation that anyone, from the criminal to the most impeccable civic leader, could produce letters of recommendation full of glowing tribute and praise. It was generally agreed, nevertheless, that letters of recommendation are desirable, but that whatever value they possess lies in a knowledge of the writer and the extent of his dedication to honest and unprejudiced evaluation. It was brought out that in several instances, excellent rapport had been developed between teachers in preprofessional colleges and the dental schools and that these relations had proved invaluable in assessing the relative merits of applicants for admission.

This report has merely recorded a few of the highlights of the session. The participation by the audience exceeded that in any other such Congress within the memory of the moderator; the earlier topics during the session were so enthusiastically explored as to make it impossible to present several additional topics which had been proposed. It was apparent that the subject is one of great interest and one to which justice could not be given in one morning session.

The session closed by commending the Council on Dental Education and by expressing appreciation to Bert L. Hooper, chairman, and Shailer Peterson, secretary, of the Council for arranging a program which provided an opportunity to so many people to benefit from discussions based on the experience of qualified workers in the several areas of dental practice, examination and licensure, education, testing and admissions. It is to be hoped that the Council may find it possible to continue these explorations at subsequent sessions.

John E. Buhler

WHAT CONSTITUTES A SPECIALTY IN DENTISTRY

The panel was opened by the reading of prepared papers by each of the panel members. These papers defined specialists and specialties and then went on to explain the reasons behind the recognition of the specialties and the establishment of the specialty boards. They furthermore set forth the requirements for certification by the boards represented by the panelists, and gave other special information regarding the field. Immediately after the reports, various members of the audience discussed the areas already covered and several spoke on the requirements in fields not represented by the panel members. These other subjects included periodontology and oral surgery.

When the discussion was opened for participation by members of the audience it quickly became apparent that, although each felt that he understood perfectly just what a specialty was, there were varying degrees of emphasis on the different parts of such definitions. To some the term seemed to denote a restriction of activity to a particular area of work. To others it denoted a special knowledge and skill. To still others a specialty seemed to be a field established by the setting up of boundaries beyond which its interest did not extend, and to still others it meant extra training beyond the undergraduate level of instruction. Several different definitions were given; namely, that which appears in most dictionaries and reads as follows: "An object or class of objects distinguished by some special characteristic, individual quality, or the like." This

definition goes on further to interpret a specialty as that "in which one specializes or has special knowledge, a branch of knowledge, art, science or business to which one especially devotes oneself." This definition is found in Webster's Dictionary and it will be noted that it stresses restriction of the field. Another definition given is that which appeared in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION.[1] Here it states:

> Specialties will be recognized as those particular fields in which disorders and deformities may assume proportions that call for more than ordinary skill in prevention or treatment under the following conditions: (1) that public need and demand for such special services shall have called into existence practitioners whose knowledge and skill are readily available; (2) that the numbers limiting their services to a specialty shall have reached the point of group consciousness that has resulted in national organization of those engaged in a given field; (3) that these groups shall have contributed materially to the advancement of the science and of the art of the special field.

This statement is also a part of the Council on Dental Education's definition of a dental specialty. It will be noted that this definition stresses extra skill and knowledge, public need and demand, and the existence of specialists in a group.

In addition to these items, all of which were stressed by one or more of the various discussers, several pertinent factors were held to be responsible for the establishment of specialties, and several factors were discussed which seemed to limit or control the development of the specialty area. These were as follows:

1. A special interest on the part of individual dentists or small groups of dentists seemed to be the motivating force in the establishment of fields which ultimately became specialties.

2. The dental colleges were blamed for not offering sufficient training in certain areas. Examples of such neglect were pointed out in the field of orthodontics, pedodontics, periodontics and public health.

3. The necessity for considerably longer training than that available in the undergraduate curriculum was cited as a problem needing study. Under this heading were listed oral surgery, orthodontics, and public health.

4. The necessity of wider experience than that offered by the dental school clinic showed the need for hospital and field programs. Adequate clinical experience in oral pathology probably can be obtained best only in a hospital and any extensive experience in public health can be obtained only outside the dental school.

The widest spread of opinion among members of the audience developed over the question, "What fields should be considered specialties in dentistry?" The answers to this question ranged from the opinion expressed by one discusser that only orthodontics deserved this designation to one that suggested the inclusion of all fields except operative dentistry. There was little disagreement, however, that orthodontics, oral surgery and oral pathology were entitled to specialty standings. The inclusion of public health dentistry as a specialty was explained on the basis of the character of the service and practice rendered.

A related point discussed was one which dealt with the future of dental education and its aims. The question arose as to whether the colleges of dentistry should alter their curriculums in favor of more specialism or less. Several individuals expressed the opinion that the present curriculum which consists of piling course on course was resulting in a profession that was almost middle aged before it "got its feet wet." These advocated a return to a more fundamen-

1. Specialties in dentistry: present status and recommendations for the future. J.A.D.A. 34:527 April 15, 1947.

tal course of a general nature with specialization following, if desired. When the discussion took this turn it was inevitable that certain members of the audience, and particularly those interested in dental education and administration, should ask who would be expected to assume responsibility for this added training of the dentist. Whereas medicine has delegated to the hospital the task of postgraduate education for the medical graduate, the dental school has accepted this responsibility as its own and has sought to augment its staffs and to offer work beyond the undergraduate level.

The desirability of the establishment of dental internships or other types of postgraduate generalized training was pointed out, and there seemed to be almost unanimous agreement that some type of internship or general experience should be undertaken by the prospective specialist before entering on his restricted study and work.

A problem that has plagued those responsible for the setting up of requirements for certifying boards was brought to the attention of the audience with the question, "Should the length of time devoted to advanced training be the same for all specialties of dentistry?" It was pointed out that certain of the specialties should be able to train men by concentrated experience and practice over a short period of time as compared to those which must rely on observation of results over longer periods. Such a difference might be said to exist between such fields as prosthodontics on the one hand, where the success or failure of a given procedure can be determined in a matter of days, whereas long periods of time, frequently months or years, are required to test the validity of theories and procedures in orthodontics and oral surgery.

An Opinionnaire was handed to each member of the audience before the meeting started and each was asked to write in the appropriate column the answer to four questions which would be brought up in the course of the afternoon session. These were left at the door after the meeting and the tabulation will be found in Table 2.

Although the discussion was an interesting and stimulating experience, it is doubtful whether many opinions were changed. This may have been due to the manner in which the title of the panel was worded. There was an effort made to answer the question, "What constitutes a specialty in dentistry?," but it was never answered in a manner that would be satisfactory to most persons. This was probably because it was interpreted as a request for a definition. Probably a better question would have been, "What areas of dentistry lend themselves to specialism and why?" This might have brought out a consideration of such factors as (1) the size of the body of knowledge in a given field in relation to the time available for its coverage in the dental curriculum and (2) the relative seriousness of a lack of complete knowledge in terms of patients' welfare.

It was, however, encouraging to note that small credence was given to the facetious definition of a specialist as "one who knew more and more about less and less," and to substitute for it that which holds that, "A specialist is a broad man sharpened to a point."

Allan G. Brodie

Cases and Comments

A NEW TREND IN COMMUNITY TREATMENT PROGRAMS

By Chester J. Schultz, D.D.S., supervisor of dental clinics, Division of Health, Cleveland

The Division of Health of the City of Cleveland has been faced with the problem of providing dental care for an increasing number of indigent children in the public and parochial schools over the past several years. Despite the limited budget, an attempt has been made to restore all first molar teeth, along with some bicuspids and second molars, for these children in the elementary grades. In the public schools, these services have been rendered in three clinics of one, two and four chairs, respectively, and in the Newton D. Baker Health Center, which has four chairs. At present, the equipment in the school clinics is rather obsolete, but there is modern equipment in the Health Center. The children are examined by the dentists of the examining staff of the public schools who are employed by the Cleveland Board of Education and by the examining dentists in the parochial schools who are employed by the Division of Health of the City.

The children whose parents have been rated as indigent according to the Family Health Service rating after interviews by the dental hygiene teachers and the dental assistants are referred to dental clinics for services. Those not rated indigent are referred to private dentists.

About two years ago, services at the Health Center were extended to include the restoration of anterior teeth and root canal therapy in anterior teeth, when indicated. This meant a reduction in the number of first molars and other posterior teeth that it was possible to care for since the clinics were not fully staffed with graduate licensed dentists. It was impossible to pay the dentists sufficiently high salaries to warrant their remaining away from their offices. The task of maintaining an adequate staff has been further complicated by the number of newly graduated dentists who were called into the armed services.

The unit costs—which consist of materials, salaries, electricity, laundry, cleaning and a prorated amount of the costs of heat and rent, and depreciation and repair of equipment—were approximately $3.28, which was too high. Also the dentists were seeing only about 4.7 patients in an average two-and-a-half hour clinic session. This was too costly and it became necessary to reduce unit costs as well as to improve efficiency.

This plan of dental services for indigent children has been in operation since 1941. It is a joint venture of the Division of Health, the Cleveland Board of Education and the Cleveland Dental Society. The Advisory Committee of the Cleveland Dental Society advises as to the policy of operating and recommends to the Division of Health the personnel that is hired. The Board of Education furnished the original equipment for the clinics in the schools and also furnished the space that is now used for the school clinics. In addition, they keep the equipment in repair. The Division of Health pays the salaries of all personnel and pays for material used and for any equipment which is added.

Several years ago, when it began to be difficult to get licensed dentists of the caliber desired for the staff, the Advisory Committee suggested that senior dental students be used to take up the slack. This suggestion was explored, and the Western Reserve University Dental School became very much interested. The Newton D. Baker Dental Clinic was designated as an auxiliary teaching center of the Dental School. Some federal funds were made available through the Dental Division of the Ohio Department of Health, and the new program was inaugurated in the fall of 1951. The addition of the students took up some of the slack, but I was interested in bettering and increasing the services rendered by the dentists. I had heard a good deal about the efficiency of the United States Public Health Demonstration Unit at Richmond, Ind., and I decided to investigate it. I spent several days at Richmond, working with the operators and assistants. I was much impressed and saw that this plan, with slight modifications, could be adapted for use in Cleveland. In August 1951, I sent two assistants to Richmond for two weeks' training. These two girls are now used to train the other assistants employed in the clinics.

At present, a multiple chair plan of operation is used at the Health Center in the morning, with two dentists, four assistants and a receptionist. The dentist and the chairside assistant use operating stools, and they do not move from these stools during the operative procedure. The chairside assistant keeps the operating field clear with the water and air syringes and hands the dentist whatever instru-

ments are necessary. Anything that is not at hand on the tray is supplied by the roving assistant as called for. The roving assistant also seats and dismisses the patient, which eliminates lost motion for the dentist. Sitting on stools while operating decreases fatigue.

In this program it is necessary to have only one instrument cabinet and one sterilizer for each two chairs, since the roving assistant brings all materials to the chair. The assistants interchange positions after an hour or so, which means that they are efficient in either capacity.

The afternoon program at the Health Center is operated by the senior dental students from the Western Reserve University Dental School. There are four students each session, together with the professor of pedodontics, or his assistant, who checks the student's work. One week of each semester of the senior year, the students spend afternoons doing all types of dentistry for the children at this Clinic. Each student operates at one chair and one assistant works with him. This is satisfactory since the average student is a much slower operator, and each step of his work must be checked by his instructor.

The fact that the student works with a trained dental assistant is extremely valuable because it shows the student what is expected of him when he works with a good assistant. Also, he is introduced to a different type of instruments and equipment from those he has used at the Dental School Infirmary. This helps him to decide on the instruments and equipment he wants to use when he goes into private practice. Another advantage is that he has somewhat more ideal working conditions than in the Dental School Infirmary.

Since the new plan has been in effect in the morning sessions, the dentists have been operating on an average of 7.5 patients per clinic session as compared to 4.7 previously.

The figures on the unit costs are not available to date, but I feel sure they will show a considerable reduction even though the costs for salaries and supplies have increased. The dental students seem enthusiastic about operating in the clinic. In addition, they are gaining practice in pedodontics as well as acquiring a better understanding of the public health aspects of dentistry. The Dental School gains by being able to offer the student these additional advantages. The patients gain from the change in program because they get better dentistry under more efficient conditions, which in turn means a reduction in the length of time they have to spend in the dental chair. The city schools gain because more dentistry can be given to more children who would not otherwise have care.

A plan is under way to introduce this new method of operating in two additional clinics —a four-chair one at Harmon School and a two-chair one at the Gilbert School. Four dental assistants and two dentists will be used in one clinic and two dental assistants and a dentist in the other.

There are many intangible advantages that cannot be measured in this program, such as the greater efficiency which the dentists on the staff have acquired which helps them when they leave the clinic to devote full time to private practice. Another advantage is that the smoother working of the clinics reduces the problem of supervision.

In conclusion, there are two important advantages in the plan. First, the working conditions and the productivity of the full-time operators are vastly improved. Secondly, the senior dental students, on graduation, will be much better trained and will have had the benefit of the experience of working with dental assistants under efficient office operation. Also they will have a much better idea of the problems of public health since they have actually observed these problems in a clinic.

10465 Carnegie Avenue

ROENTGENOLOGY'S PLACE IN DENTURE PROSTHESIS

Sam W. Williams, D.D.S., M.S.D., Minneapolis

The most overlooked aid in the science of denture prosthesis probably is roentgenology. Roentgenology is by no means a panacea nor is it the most important phase of the process, but it does occupy the unique position of being one of the most important guides in treatment planning, for it gives an accurate and precise picture of the substructure on which the dentures are to rest. To construct any type of denture, either partial or complete, without first having made a complete roentgenographic survey is not unlike selecting the mold and shade of denture teeth with eyes tightly closed.

Although a roentgenographic survey of the edentulous mouth is neglected too frequently by many prosthodontists, one important aspect of such a survey—the intraoral occlusal roentgenogram—is almost wholly disregarded. Perhaps this neglect is because the technic of intraoral occlusal roentgenography has never been sufficiently emphasized in dental schools or in postgraduate courses covering roentgenography.

Occlusal roentgenography is in reality an extremely simple and inexpensive process and can be taught to the general practitioner with

a minimum of effort. The only extra item needed in the already established armamentarium is the occlusal film which measures 2 by 3.5 inches. Maxillary occlusal roentgenography is accomplished by placing the tube side of the film on the maxillary ridges so that the long axis of the film runs from tuberosity to tuberosity across the mouth, and the narrower axis runs anteroposteriorly. In the completely edentulous mouth it is advantageous to have the patient use the thumbs of both hands to hold the film in position against the ridges. When sufficient teeth are present, the film can be held in position by having the patient close the jaws, thus forcing the film against the area to be surveyed. The latter method can be used for the survey of the mandible as well as for the maxilla.

The cone of the x-ray machine is placed so that the central beam of radiation is directed at the bridge of the nose vertically and forms an angle of about 80 degrees from the horizontal when the maxillary occlusal plane is parallel with the floor. The tube of the machine is placed parallel with the film in the horizontal axis.

In mandibular occlusal roentgenography, the tube side of the film is placed directly against the lower ridges as for the maxilla and is held in position by both index fingers. The patient's head should be placed in such a position that the film is at right angles to the floor and the central beam of radiation is directed at the middle of the film and at right angles to it.

In this view it is advantageous to have the patient's back and back of the head parallel with the floor.

The occlusal roentgenogram should be considered much like the photofluorogram which is used in mass chest roentgenography. The purpose of the photofluorogram is to record in miniature on a 3 by 5 film the patient's thoracic region, which photofluorogram is viewed in turn by the roentgenologist. If suspicious areas are present, a large 14 by 17 inch chest film is taken to give a more accurate diagnostic picture.

The advantages of occlusal intraoral roentgenography are as follows:

1. Large areas can be surveyed on one film; therefore, less time is spent in the dark room.

2. Only two films are necessary to view the complete denture base areas.

3. As a rule when large areas of pathology are present they can be viewed *in toto*.

4. Periapical views can be made from different angles of any pathologic condition.

It cannot be overemphasized that this technic is indispensable if the prosthodontist is going to render a complete service to his patients. Unfortunately, its lack of use has caused too many failures for it to be disregarded. More emphasis should be given to its benefits so that the technic will gain wider use in the future. If routine intraoral occlusal roentgenography becomes standard practice in the the examination of the edentulous patient, one more stumbling block on the road to success will be eradicated.

800 La Salle Building

BUREAU OF LIBRARY AND INDEXING SERVICE

Additions to the Library

The books and package libraries listed here have been added recently to the library collection. Requests for this material, available on loan to all members of the Association, should be addressed to the Bureau of Library and Indexing Service. There is no charge for borrowing books, but a rental fee of fifty cents should accompany requests for each package library. Most of the books may be purchased also through the library.

BOOKS

Asociación Odontológica Argentina. Odontología y mecanica dental. Buenos Aires, The Association, 1952. 288 p.

Becks, Hermann. Nutrition as applied to the practice of dentistry. Toronto, University of Toronto, 1952. 130 p. $6.00.

Bellak, Leopold, editor. Psychology of physical illness. New York, Grune & Stratton, 1952. 243 p. $5.50.

Berghagen, Nils. Photogrammetric principles applied to intraoral radiodontia. Stockholm, Ivar Haeggströms Boktryckeri, 1951. 88 p.

Berliner, Abraham. Clinical periodontology; dynamics and treatment. New York, Park Press, 1953. 249 p. $18.00.

Blood Clotting and Allied Problems. Transactions of the fifth conference, January 21 and 22, 1952. New York, N. Y. New York, Josiah Macy, Jr. Foundation, 1952. 368 p. $4.95.

Bunting, R. W. The story of dental caries. Ann Arbor, Mich. Overbeck, 1953. 94 p. $2.50.

Carlsöö, Sven. Nervous coordination and mechanical function of the mandibular elevators. (Acta Odontologica Scandinavica, Vol. 10, Sup. 11.) Stockholm, Victor Pettersons Bokindustri Aktiebolag, 1952. 132 p.

Castiglioni, Arturo. A history of medicine. New York, Knopf, 1947. 1,253 p. $12.50.

Colyer, J. F. Dental surgery and pathology. 9th ed. London, Butterworth, 1953. 1,151 p. $15.00.

European Orthodontic Society. Twenty-sixth annual congress, July 1949. The Hague, Albani, 1949. 214 p. $6.00.

European Orthodontic Society. Twenty-seventh annual congress, May-June 1951. The Hague, Albani, 1951. 279 p. $6.00.

Gard, Knut, editor. Norske tannlaeger. Oslo, Norske Tannlaegeforening, 1950. 649 p.

Glickman, Irving. Clinical periodontology; the periodontium in health and disease. Philadelphia, Saunders, 1953. 1,019 p. $15.00.

Groh, R. W. Fundamentals in operative dentistry. Buffalo, N. Y., The Author, 1942. 53 p. $1.75.

Hedgecock, L. W. & Ferrillo, P. J. Laboratory guide in dental bacteriology. Minneapolis, Burgess, 1950. 77 p. $2.00.

Jones, W. E. Scientifically designed partial veneer or three-quarter crown. Minneapolis, Burgess, 1952. 62 p. $3.00.

Kettering Laboratory. Classified bibliography of publications concerning fluorine and its compounds . . . Cincinnati, Kettering Laboratory, University of Cincinnati, 1950- mimeo. $25.00.

Lerman, Salvador. Historia de la odontología, y su ejercicio legal. Buenos Aires, "El Ateneo," 1942. 332 p. $6.00.

Leslie, G. H. A biometrical study of the eruption of the permanent dentition of New Zealand children. Dunedin, John McIndoe, 1951. 72 p.

Nevin, Mendel, compiler. Problems in dental local anesthesia. Revised and edited after his death by Hillard R. Nevin. Brooklyn, Dental Items of Interest, 1952. 760 p. $10.00.

Ripman, H. A., editor. Guy's hospital, 1725-1948. London, Guy's Hospital Gazette Committee, 1951. 176 p. $3.75.

Robinson, Victor. Victory over pain, a history of anesthesia. New York, Henry Schuman, 1946. 338 p. $3.50.

Rounds, W. R. & Rounds, C. E. Principles and techniques of exodontia. St. Louis, Mosby, 1953. 407 p. $10.00.

SARTON, GEORGE. A guide to the history of science. Waltham, Mass., Chronica Botanica Co., 1952. 316 p. $7.50.

SARTON, GEORGE. A history of science; ancient science through the golden age of Greece. Cambridge, Harvard University Press, 1952. 646 p. $10.00.

SCHLOSSER, R. O. & GEHL, D. H. Complete denture prosthesis. 3d ed. Philadelphia, Saunders, 1953. 511 p. $8.50.

SCHNECK, J. M. Hypnosis in modern medicine. Springfield, Ill., Thomas, 1953. 323 p. $7.50.

SIGERIST, H. E. A history of medicine. Vol. 1. Primitive and archaic medicine. New York, Oxford Univ. Press, 1951. 564 p. $8.50.

SMITH, F. A. An annotated bibliography of the literature on the pharmacology and toxicology of fluorine . . . Rochester, N. Y., Univ. of Rochester, 1951. 152 p.

SPOTTISWOODE, RAYMOND. Film and its techniques. Berkeley, Calif., Univ. of California Press, 1951. 516 p. $7.50.

STEWART, T. D., editor. Hrdlicka's practical anthropometry. 4th ed. Philadelphia, Wistar Institute of Anatomy and Biology, 1952. 241 p. $5.00.

WETZEL, GEORG. Lehrbuch der Anatomie für Zahnärzte und studierende der Zahnheilkunde. 6th ed. Jena, Gustav Fischer, 1951. 723 p. $12.00.

PACKAGE LIBRARIES

Burning mouth
Caries, dental—relation of ammonia and derivatives
Cortisone and ACTH in relation to dental conditions
Dens in dente
Denture base stomatitis
Dentures—surgical retention (implant dentures)
Equilibration of natural teeth by grinding
Hemostasis and hemostatic agents
Hyaluronidase
Identification by means of teeth
Implant dentures (see Dentures—surgical retention)
Injections—extraoral
Monocaine
National Health Service in Great Britain
Nutrition in relation to dental health
Occlusion
Orthodontics, anchorage in
Orthodontics and musical instrument playing
Orthodontics—retainers
Prepayment and postpayment plans
Sicher's (Harry) articles
Submerged and ankylosed teeth
Unacaine
Zinc oxide preparations

The American Dental Association Film Library

The Association Film Library, since September 1952, has been previewing dental health and technical films for possible showing at the annual session in Cleveland, September 28 to October 1, 1953. Any readers who have recent films that depict some phase of diagnosis, treatment or research which is related to the practice of dentistry or to the improvement of health are reminded that the deadline for receipt of applications is July 1. Anyone interested in participating in the motion picture program may request an application from the Council on Scientific Session. Submission of completed application, however, does not necessarily mean acceptance since all films must be approved by the Council on Scientific Session.

The following films have been added to the Association Film Library and are now available to dental societies, study clubs and dental schools. Since the number of prints of each title is necessarily limited, it is suggested that program chairmen of dental societies and study

clubs plan their programs far enough in advance to insure availability.

FILM REVIEWS

Principles of Biopsy • 16 mm., color, magnetic sound, 425 feet, 13 minutes. Produced in 1952 by the University of Minnesota School of Dentistry. Demonstrated by David F. Mitchell, D.D.S., Ph.D., and George W. Yamane, D.D.S. Photography by James H. Rothenberger. Procurable on loan ($2.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago 11, or from the University of Minnesota School of Dentistry.

This film presents two simple biopsy procedures that may be used by the dentist. The first method, the excision of a representative area from a large lesion, is demonstrated on a wax model and on an actual patient. A deep elliptical section with adjacent normal tissue is removed and is fixed immediately in 10 per cent Formalin. Caution is exercised to avoid distortion in the removal. The second method, complete excision of a small lesion including some adjacent normal tissue, also is demonstrated on an actual patient. This patient has a nodule on the lower right quadrant of the tongue. The same procedure is followed of immediate fixation in 10 per cent Formalin. The specimen, with identifying information, is sent to the pathologist. The diagnosis in the first case is squamous cell carcinoma and in the second, fibroma or papilloma. This is an excellent film for use in teaching since it is well organized and presented. The photography and lighting enable the viewer to see all the steps involved clearly. In order to hear the magnetic sound track, the film must be projected on a magnetic sound projector. This does not mean, however, that it is impossible for a dental society or dental school without such a projector to use the film. Since the legends and titles make it self-explanatory, it can be shown as a silent film with a regular 16 mm. sound projector.

This film is suitable for dental students since its brevity makes it practicable for integration into a teaching period of a course on oral pathology. Dental societies and study clubs will find it interesting program material. It may be combined with another University of Minnesota film "Examining the Oral Cavity," which was reviewed in the January 1953 issue of THE JOURNAL, or with R. H. Brodsky's series of 100 slides, "Atlas of Oral and Facial Lesions," listed on page 26 of the American Dental Association's 1953 *Catalog of Dental Health Education Material*. Both the film and the slides are available from the Association Film Library.

Complete Dentures—Alginate Impressions • 16 mm., color, sound, 736 feet, 18 minutes. Produced in 1950 by the Department of the Navy, Bureau of Medicine and Surgery, Dental Corps, Washington, D. C. Procurable on loan ($2.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago 11, and from the Department of the Navy, Bureau of Medicine and Surgery, Dental Corps, Washington 25, D. C. Procurable for purchase from United World Films, Inc., 1445 Park Ave., New York.

This film illustrates a technic for nonpressure full denture impressions using alginate (irreversible hydrocolloid) in a loose-fitting, perforated baseplate tray. It demonstrates one method of taking impressions, using plaster of paris and artificial stone. The contour of the upper denture is outlined by marking the posterior and buccal borders of the tray. A single thickness of baseplate material is used as a spacer. The same method is employed in taking the lower impressions. After the border has been warmed and trimmed to approximate the outline of the cast, the cast is checked and then trimmed on an abrasive wheel. The tray is then adapted to the underlying spacer and rough cut along the spacer. The alginate impression material is then mixed and the impression taken. A heavy mixture of stone is vibrated into the impressions. The vibrating technic removes air bubbles. The casts are allowed to set for 30 minutes before trimming and finishing. This film is well organized and presented. The photography is good. The summary increases its instructional value. The brief showing time makes it practicable for integration into a teaching period of a dental course on denture construction. It may also prove interesting for dental societies and study clubs. It is suitable for dental students, general practitioners and prosthodontists.

COUNCIL ON DENTAL RESEARCH

List of certified dental materials

Samples of the certified impression compounds were recently retested by the American Dental Association Research Fellowship at the National Bureau of Standards under the supervision of that Bureau. These materials were found to comply with American Dental Association Specification No. 3 for Dental Impression Compounds. This list supersedes that published in the November 1952 issue of THE JOURNAL.

CERTIFIED IMPRESSION COMPOUNDS (A.D.A. SPECIFICATION NO. 3)

Compound	*Type*	*Manufacturer or distributor*
Certified	I	Lee S. Smith & Son Mfg. Co.
Exact	I	The S. S. White Dental Mfg. Co.
Kerr Perfection; No. 2 Soft Green; Gray; White; Black	I	Kerr Mfg. Co.
Mizzy-Low Heat	I	Mizzy, Inc.
S. S. White-Black-Tray	II	The S. S. White Dental Mfg. Co.

JUNE 1953

LON W. MORREY, D.D.S., EDITOR
VOLUME 46 • NUMBER 6
Published by the American Dental Association
222 East Superior Street • Chicago 11, Illinois

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Editorial

Fédération Dentaire Internationale meets in Oslo and opens drive for supporting memberships

American dentists traveling in Europe this summer will wish to attend the annual session of the Fédération Dentaire Internationale scheduled for Oslo, Norway, July 26 through August 1. Oren A. Oliver, of Nashville, president of the F.D.I. and former president of the American Dental Association, issues an urgent invitation to all members of this Association to join the international organization and, if possible, to attend the Oslo meeting.[1] Writing in the May issue of THE JOURNAL, Dr. Oliver stressed the importance of giving full support to the Fédération Dentaire Internationale and pointed out that "at no time in the history of the dental profession has it been more essential for there to exist an active, well organized international body representing world-wide dentistry." The future usefulness and effectiveness of this international dental organization will depend largely on the support received, not only from participating national dental societies but from the individual members of those societies as well.

The Fédération Dentaire Internationale, founded in 1900, is, as its name implies, an association of national dental organizations and their affiliated societies. When founded a half century ago, its primary purpose was to sponsor an international dental meeting or congress at five year intervals. Time and experience broadened the social and scientific horizons of the organization so that its current objectives, in addition to promoting dental congresses, are to aid each nation to develop a strong national dental society; to stimulate the exchange of information between national dental societies; to publish an *International Dental Journal;* and to cooperate with other international organizations in the health and scientific fields. The Fédération

Dentaire Internationale, for example, represents the science of dentistry in the World Health Organization which is the official instrument of the United Nations.

Despite the handicap of two world wars, the Korean conflict and other international disturbances, the Fédération Dentaire Internationale has not only remained intact but it has broadened the scope of its usefulness. It is the only international health organization, except for the Red Cross of Geneva, that remained unshaken by the two world conflicts. It now typifies, as President Oliver points out, "the ideal international organization envisioned by its founders. It stimulates the creative abilities of minority groups and encourages the individual to work unhampered in a non-governmental organization, the sole object of which is the improvement of mankind."

Primarily the Federation depends on financial support from dues paid by member national dental societies and from contributions received from individual dentists who enroll as supporting members. Supporting membership including a subscription to the *International Dental Journal*, a quarterly publication devoted to the advances and problems of international dentistry, may be secured annually for $9 by writing Philip E. Adams, U. S. A. national treasurer of the Federation, 106 Marlborough Street, Boston. Present subscribers to the *International Dental Journal* may secure a supporting membership for $3 and renew their journal subscription later. Dentists who plan to attend the Oslo meeting of the F.D.I. in July may obtain information on hotel reservations and travel arrangements from Knut Gard and Gudwin Sydnes, Den Norske Tannlaegeforening, 17 Incognitogatan, Oslo, Norway.

The Fédération Dentaire Internationale has long since ceased to be a paper organization or an association in name only. It is a growing vital entity, one destined to play an important part in the improvement of world health and international understanding. Every dentist who has these objectives at heart can well afford to participate in its undertakings.

1. See page 674 of this issue.

Revised physician-dentist draft act extended for two more years

Now that the bill to extend the physician-dentist draft act has been approved by the House of Representatives, passage by the Senate and the signature of the President is all that is needed to convert it into law. Its provisions will affect profoundly the lives of the 13,000 physicians and 6,000 dentists now in military service and the 7,500 physicians and 4,500 dentists who, it is estimated, will be drafted during the next two years.

The Association has been keenly concerned over the provisions of the new legislation and has endeavored to have weeded from it passages which allowed certain inequities to exist under Public Law 779. Speaking on the provisions of H.R. 4495, J. Claude Earnest, member of the Council on Legislation, pointed out to the Com-

mittee on Armed Services that the Association is opposed on fundamental grounds to any law which singles out members of the health professions for military service solely because of their professional skills. Nevertheless, the Association recognizes the necessity for such legislation because of the existing world-wide conditions and offers full cooperation in the preparation of a practical program which will provide the fullest type of dental service to both the military and civilian population within the limits of existing personnel.

Dr. Earnest presented to the Committee on Armed Services twelve points adopted by the Board of Trustees which the Association believes should be included in the new legislation. Briefly these are: the law should not be extended beyond June 30, 1955; the maximum age for induction of dentists should be maintained at 51; the advisory committees to Selective Service should be maintained; credit should be given for service with an allied government in World War II and for service in World War II prior to entering an ASTP or V-12 course; maximum required service should be limited to 24 months with provision for earlier release under certain conditions; persons who have served and were discharged after June 25, 1950 should be excluded from further service except during war or national emergency; the $100 per month special pay for dentists should be retained; persons essential to the community or nation, those disabled and those who, if drafted, would be subject to severe personal hardship should be deferred; rank or grades of dental officers should be assigned more equitably, according to experience and service; persons should be deferred whose induction would seriously diminish the quality or quantity of dental education; and a sufficient number of preprofessional students should be deferred to assure a reservoir for the procurement of future dental, medical and veterinary students.

In essence, all of these provisions have been included in the new legislation except the provision for the $100 per month equalization pay. The Association will continue to fight for that provision. The reasons for its retention are obvious to the fair-minded. If Congress must induct into the Armed Forces a dentist who would not be liable except for the special obligation imposed by a special registration law, it should recognize the special burden which such action imposes and, in all fairness, make some financial adjustment that in part will lighten that burden.

Washington News Letter

Congressional hearings on proposed legislation are highly revealing for a number of reasons. Not only do they develop facts and elicit opinions on the issue at hand but they bring out the pet theories and prejudices of members of Congress, subject controversial questions to debate and furnish a good clew to the line of thinking which Senators and Representatives are following.

When John W. Knutson, chief dental officer of U.S. Public Health Service, appeared several weeks ago before a House appropriations subcommittee to testify on national dental health needs, he was questioned closely on periodontal disease, fluoridation of water and policies of the American Dental Association. The interrogation betrayed deep interest in these subjects on the part of the subcommittee chairman, Rep. Fred E. Busbey (Rep., Ill.), and its former chairman, Rep. John E. Fogarty (D., R. I.).

Rep. Busbey asked Dr. Knutson to explain, in detail, the procedure for gaining acceptance of new methods of therapy. He took periodontal disease as an example. The witness described the clinical testing, publication in the literature and other steps which generally precede adoption of a new drug or technic. He noted that the American Dental Association plays an important role in the process of evaluation.

"It is not an easy or a simple process by any stretch of the imagination, is it?" Rep. Busbey asked.

"No, indeed," Dr. Knutson replied.

During the course of questioning, he stated that U.S. Public Health Service is receiving a large volume of protests against fluoridation; said the value of ammoniated tooth pastes in prevention or reduction of caries remains dubious, and expressed the need for additional federal funds to assist the states in dental public health.

The case for adequate financial support of dental research was presented to the subcommittee several weeks after Dr. Knutson's testimony by Thomas J. McDermott, vice chairman of the A.D.A. Council on Legislation. He stressed the disproportionately low sums which Congress allocates for dental research grants, compared with funds earmarked for aid to studies of cancer, heart disease, mental illness and other health problems.

Subsequently President Eisenhower received an A.D.A. delegation headed by Otto W. Brandhorst, president, who urgently recommended the appropriation of Federal funds for support of dental research commensurate with the problem.

DRAFTEES', VETERANS' DENTAL CARE

Congress will adjourn this first session of the 83rd Congress and be on its collective way home before the end of July, barring some extraordinary turn of events. This means that practically all of the bills introduced so far this year which are of direct interest to dentistry are destined to lay over until 1954. But the fact that early action is unlikely is not discouraging legislators from sponsoring and introducing measures of one kind or another.

Within the last few weeks, Sen. Milton R. Young (Rep., N. D.) and Rep. Olin E. Teague (D., Texas) filed bills that are of more than passing interest. The former's has the ambitious objective of providing corrective dental care, at government expense, for prospective draftees prior to their induction by Selective Service. If practicable, the work would be done by Veterans Administration dentists, otherwise " . . . such correction may be done by a qualified dentist engaged in private practice in the vicinity of the registrant's residence who, by contract with the Selective Service System, made under regulations prescribed by the Director, has undertaken to perform such service in conformity with such regulations."

The Young bill further specifies that "to the greatest practicable extent, each registrant authorized to receive dental service from a dentist engaged in private practice shall be entitled to receive such service from the dentist of his choice."

Whereas this plan would be quite costly, the Teague bill is aimed at reducing the government's large dental care bill by restricting eligibility of veterans for services of this kind. Briefly, it provides that Federal responsibility for care of a service-connected dental disability shall cease three years after the individual's separation from active duty. If the disability were of such a degree as to be compensable, the cut-off would not be applied.

Exemption also is provided for adjunct outpatient dental services for conditions associated with a disability resulting from some other service-incurred disease or injury, whether or not the individual was hospitalized.

DRAFT LAW EXTENSION

Extension of the so-called doctor-draft law for two more years was virtually assured May 12 when the House passed an enabling bill. Observers felt that any floor fight on this issue would be more likely to come in the House, and since that branch of Congress gave its assent speedily, subsequent approval by the Senate appeared certain.

The latest compilation, by Selective Service headquarters, of data on special registrants discloses that there were 37,995 special dental registrants on record as of March 31, 1953. These were divided, by priorities, as follows: Priority I, 4,338; Priority II, 816; Priority III, 14,744; Priority IV, 18,097.

Since the induction process has not yet reached Priority IV dentists (veterans of past military service), only 21 of the 18,097 in this category have been classified by their local draft boards. With reference to the other three priorities, 1,755 were deferred—as of March 31—for reasons of professional essentiality; 3,978 were in 4-F; 960 were members of Reserve units, and 2,766 were on active duty in the Armed Forces. An additional 4,551 had been passed physically and placed in 1-A but had not yet received their "Greetings" from Selective Service. All but 207 of these were in Priority III (non-veterans), demonstrating that the Priority I and Priority II pools are virtually exhausted.

Since registration was begun nearly three years ago, 141 dentists have died and 609 have had their registrations canceled. Fourteen had been inducted into the Army as privates most of whom subsequently were commissioned in the Dental Corps.

Association Affairs

PRESIDENT EISENHOWER MEETS WITH ASSOCIATION OFFICERS

President Dwight D. Eisenhower and representatives of the American Dental Association conferred April 30 on the importance of expanding dental research and of erecting a building for the National Institute of Dental Research.

Otto W. Brandhorst, president of the Association, requested President Eisenhower to support the erection of the long-authorized building for the N.I.D.R. and to encourage the expansion of dental research, which will bring "a constructive approach to the increasingly expensive dental program of the Veterans Administration."

In addition to Dr. Brandhorst, representatives of the Association included Daniel F. Lynch, trustee; Harold Hillenbrand, secretary; C. Willard Camalier, assistant secretary, and John Hollister, business manager.

H. TRENDLEY DEAN APPOINTED RESEARCH COUNCIL SECRETARY

H. Trendley Dean has been appointed the first full-time secretary of the Council on Dental Research of the American Dental Association and will establish headquarters in Chicago early this summer, it has been announced by Harold Hillenbrand, secretary.

For the past two years the Association's role in the entire field of dental research has been under study by special committees of the Board of Trustees. As a result of the recommendations of these committees, the House of Delegates amended the Bylaws in 1951 to give broader powers to the Council on Dental Research.

Under the direction of the Council on Dental Research, of which Maynard K. Hine is chairman, Dr. Dean will undertake a comprehensive survey of the present status and needs of dental research. The Council will also continue its supervision of the fellowships which the Association maintains at the National Bureau of Standards and at the National Institutes of Health.

H. T. Dean

Dr. Dean, who retired in March as director of the National Institute of Dental Research, USPHS, is credited with directing most of the USPHS basic research on fluoridation. He was graduated from St. Louis University dental school in 1916 and entered the Public Health Service in 1921.

Dr. Dean has been the recipient of many honors, including the Gorgas Medal and Award of the Association of Military Surgeons, the John M. Goodell Prize of the American Water Works Association, Jarvie Fellowship Medal of the Dental Society of the State of New York and the Lasker Award of the American Public Health Association. He is a former president and current trustee of the International Association of Dental Research and a former vice president of the Fédération Dentaire Internationale.

ASSOCIATION MEMBERSHIP LISTED AT 74,877

A total of 74,877 members have been recorded by the Association as of April 30, almost 4,000 more members than at that date last year. Included in the total are 65,704 active and life members and 8,988 student members. The final total for 1952 was 77,722.

PANEL DISCUSSIONS PLANNED FOR 94TH ANNUAL SESSION

Three panel discussions will be featured at the 94th annual session of the Association, to be held September 28-October 1 in Cleveland.

The first, entitled "Is There a Therapeutic Dentifrice?" will be presented September 29, with Thomas J. Hill of Cleveland, chairman of the Council on Dental Therapeutics, as moderator.

"Newer Anesthetics of Interest to the General Practitioner," to be presented September 30, will be moderated by F. D. Ostrander of Ann Arbor, Mich.

"Denture Service for Your Patient" will be presented October 1, with Victor H. Sears of Salt Lake City, Utah, as moderator.

Accommodations • Persons who plan to attend the 94th annual session are urged to fill out the application form on page A-65 of this issue of THE JOURNAL and to send it to the Housing Bureau in Cleveland immediately.

Associated Meetings • Dental groups which will meet in conjunction with the annual session of the Association include:

American Academy of History of Dentistry, Statler, September 26;
American Academy of Implant Dentures, Allerton, September 27;
American Academy of Periodontology, Cleveland Hotel, September 24-26;
American Association of Dental Editors, Hollenden, September 26;
American Association of Dental Examiners, Statler, September 25-26;
American Association of Dental Schools, Statler, September 26;
American Association of Public Health Dentists, Carter, September 27;
American College of Dentists, Cleveland Hotel, September 27;
American Dental Assistants Association, Hollenden, September 28-October 1;
American Dental Hygienists' Association, Allerton, September 26-October 1;
American Denture Society, Hollenden, September 25-26;
American Society of Dentistry for Children, Carter, September 25-27;
Association of American Women Dentists, Carter, September 27-October 1;
International College of Dentists, Statler, September 27;
International Society of Gold Foil Operators, Carter, September 26;
National Association of Seventh-Day Adventist Dentists, Allerton, September 26-28;
Alpha Omega Fraternity, Hollenden, September 26-28;
Delta Sigma Delta Fraternity, Cleveland Hotel, September 25-28;
Psi Omega Fraternity, Statler, September 28;
Xi Psi Phi Fraternity, Carter, September 28.

ASSOCIATION TESTIFIES ON DENTAL CARE OF DEPENDENTS

Dental care of military dependents should be limited "to strict emergency cases on any post or installation, and to essential services on posts or installations where civilian dentists are either not available or unable to assume increased patient loads."

This was the essence of testimony presented May 25 by Rudoph H. Friedrich, chairman of the Council on Federal Dental Service, before the Department of Defense's newly appointed Citizens Advisory Commission on Medical Care of Dependents of Military Personnel.

Dental care of military dependents, if not limited, requires that dentists who are needed by civilian communities be taken into the military services. Providing such service also handicaps Armed Forces dentists in their assignment of caring for servicemen's teeth, Dr. Friedrich declared.

A resolution adopted by the House of Delegates of the Association in 1951 opposes the unwarranted use of Armed Forces dentists in the care of servicemen's dependents. The resolution reads as follows:

Resolved, that the American Dental Association urge the establishment of policies under which the mission of dental officers in the armed services will be limited to maintaining and improving the efficiency of military personnel and under which this mission not be handicapped by the assignment of additional responsibilities in caring for the dental health of the dependents of military personnel.

NOTED SCIENCE REPORTER TO ADDRESS CONFERENCE

The president of the National Association of Science Writers, Arthur J. Snider of the *Chicago Daily News,* will address dental editors on "Gathering and Publishing Scientific News" during the second annual Conference on Dental Journalism, to be held June 5-6 at the Central Office of the Association.

The Conference will be presented by the Council on Journalism and the American Association of Dental Editors.

In response to requests, the featured speaker of last year, Kenneth B. Butler, will present a full-day program June 6. Mr. Butler, president and general manager of the Wayside Press, Inc., will discuss "Production Problems and How to Meet Them."

Other participants will include Charles A. Wilkie of Brooklyn, J. A. Salzmann of New York, George B. Denton of Chicago, H. Leon Snow of Lansing, Mich., John J. Hollister and Harold Hillenbrand of Chicago.

William L. Barnum of Portland, Ore., is chairman of the Council on Journalism, and Loren B. Taber of San Francisco is president of the American Association of Dental Editors.

COUNCIL ON RELIEF ISSUES FORM FOR BEQUESTS

A bequest form has been prepared by the Council on Relief for the convenience of Association members and their families who wish to bequeath a contribution to the Relief Fund of the American Dental Association.

The bequest form, issued after the Council's recent meeting in the Central Office, reads as follows:

> I give and bequeath to the American Dental Association Relief Fund, 222 East Superior Street, Chicago 11, Illinois, and its successors and substitutes, the sum of $_____, to be used for the charitable purposes specified in the indenture of trust or articles of incorporation under which said fund may operate from time to time.

The Council noted with gratitude that the Relief Fund has been the recipient of several substantial bequests in recent years.

ALLEN O. GRUEBBEL RESIGNS AS COUNCIL SECRETARY

The resignation of Allen O. Gruebbel as secretary of the Council on Dental Health, effective June 1, has been announced by Harold Hillenbrand, secretary of the Association. Dr. Gruebbel has accepted the position of professor of operative dentistry and associate director of the clinic at the University of Kansas City School of Dentistry, from which he was graduated. He will assume his new duties August 1.

Dr. Gruebbel became the first secretary of the Council in April 1944, when the Board of Trustees authorized the appointment of a full-time secretary to direct the expanding work of the Council, which had been created in 1942.

At the time of his appointment, Dr. Gruebbel was director of the Dental Division, Missouri State Health Department. He had earned his Master's degree in

public health from the Johns Hopkins School of Public Health in 1938 and was a special lecturer at the University of Kansas City and Washington University, St. Louis.

He had practiced dentistry in Lexington, Mo., for 14 years after his graduation in 1923 from the University of Kansas City School of Dentistry (then Kansas City-Western Dental College), and had served as director of the Missouri Dental Division during 1938-44. During his residence in Chicago for the past eight years, Dr. Gruebbel was a special lecturer at the Chicago College of Dental Surgery, Loyola University.

During Dr. Gruebbel's tenure of office, the Council on Dental Health cooperated with state dental societies in the conduct of local dental health workshops and in the promotion of fluoridation programs; revised the Association's health education aids, issued the *News Letter of the Council on Dental Health* and conducted the dental health conference annually during the Association's annual session.

In 1950, Dr. Gruebbel was sent to New Zealand by the Association to make a study of its dental public health services, particularly as they relate to the use of school dental nurses. The study was reported in THE JOURNAL and also in a separate brochure which has been widely distributed in this country and abroad.

Dr. Gruebbel has contributed numerous articles to scientific journals and has written chapters in two books: *Dentistry in Public Health* and *School Health Services*, soon to be published.

LIFE MEMBERSHIP APPLICANTS WARNED OF JULY 30 DEADLINE

July 30 will be the last day on which the Association will accept 1953 applications for life membership. The Board of Trustees and House of Delegates will act on the applications at the coming annual session.

Any dentist who has reached the age of 65 and who has been a member of the American Dental Association for 35 years, may apply for life membership. He will be awarded a certificate and will be exempted from paying annual dues in the Association as long as he maintains active membership in his constituent and component societies.

Application forms may be obtained by writing to Directory and Membership Records, American Dental Association, 222 East Superior Street, Chicago 11.

COUNCIL ON DENTAL RESEARCH NAMES DIVISION DIRECTORS

Research sponsored by the Association at the National Bureau of Standards and the National Institutes of Health will be administered by two newly-established divisions of the Council on Dental Research, it has been announced by Harold Hillenbrand, Association secretary.

The Division of Research, National Bureau of Standards, will be directed by George Paffenbarger; the Division of Research, National Institutes of Health, by Edward Hampp.

ASSOCIATION TESTIFIES ON VA DENTAL CARE PROGRAM

Misinterpretation of the government's obligation to care for service-connected dental disabilities has led to an unnecessarily expensive and unwieldy VA program of outpatient dental care, stated an Association spokesman May 18 before a Congressional subcommittee.

Francis J. Garvey, secretary of the Council on Legislation, testified before the subcommittee of the House Committee on Appropriations which is considering the VA budget for 1954.

His testimony criticized the "paternalistic rather than scientific" basis of the present administration of provisions for hometown dental care:

In the case of the dental problem it has been decided, based upon a solicitor's opinion, that a carious tooth becomes service-connected as an entity. This means that the Veterans Administration will provide care for that tooth throughout the lifetime of the veteran, will replace it if it is lost and will replace other non-service connected teeth if, in the judgment of the dentist, this is necessary in order to replace the service-connected tooth.

Mr. Garvey also observed that there are now nearly 20-million veterans, that this number is increasing and that 95 per cent of the veteran population will probably have dental caries, in addition to other oral disorders.

The answer to the astronomical cost of the program is not lack of appropriations, which will lead to a greater backlog of patients to be cared for, Mr. Garvey concluded; "the treatment needed is a thorough legislative revaluation of the substantive laws which grant these benefits."

LIBRARIANS TO DISCUSS PROGRAM STANDARDS

A panel discussion of criteria that librarians may use for a self-appraisal of their dental library program will highlight the Conference on the Dental Library, which will be held June 12-13 at the Central Office under the sponsorship of the Association's Bureau of Library and Indexing Service.

The discussion will be presented in cooperation with the Council on Dental Education, and the moderator will be Shailer A. Peterson, secretary of the Council.

Other participants will include Mildred Crowe, librarian of the Medical Central Library, University of Alabama; Margaret Gomori, librarian of the Billings Medical Library, University of Chicago; Helen Hlavac, librarian of New York University College of Dentistry, and J. Roy Blayney, member of the Council on Dental Education and director of the Zoller Memorial Clinic, University of Chicago.

Representatives from 17 dental school libraries and the Argentine Dental Association will attend the workshop conference, it has been announced by Donald Washburn, director of the Bureau of Library and Indexing Service.

REINSTATE EQUALIZATION PAY IN DRAFT BILL, SENATE ASKED

The $100 monthly equalization pay for dentists and physicians in the Armed Forces should be reinstated in the new "dentists-physicians draft act," said Rudolph H. Friedrich, chairman of the Council on Federal Dental Services May 20, in testimony before the Senate Armed Services Committee.

The majority of the new provisions of the draft act passed by the House May 12 meet with the approval of the Association, Dr. Friedrich stated. The fundamental changes sought by the Association are the reinstatement of the provision for equalization pay and more specific language concerning Reserve service, he concluded.

House Bill • The dentists-physicians draft bill passed May 12 by the House of Representatives provides that those men with at least 21 months of service since September 16, 1940, be exempted from further service.

The bill would also limit to a 17-month recall those who have given 12 months of service, either before or after completion of dental or medical education. Priority II men with 17 months of prior duty would be reclassified in Priority IV.

Another provision states that all men on active duty who would not have been inducted if the new bill had been law would be released within 90 days of July 1, the effective date of the proposed law. The bill provides for a basic service requirement of 24 months for all registrants except those referred to previously.

PLAN CONFERENCE ON ADDING TERMS TO DENTAL DICTIONARY

New dental concepts and terms, new European dental terms and old terms whose meanings have changed will be discussed at the second conference on nomenclature, "Supplementing the Dental Dictionary," which will be conducted June 10-11 by the Bureau of Library and Indexing Service in the Central Office.

Morning and afternoon sessions of June 10 will be devoted to papers on scientific nomenclature and changes in dental nomenclature since 1936.

On the morning of June 11, three committees will begin the consideration of assigned terms as to their appropriateness, meaning and usefulness.

The committees are: restorative dentistry and dental materials, Stanley Tylman of Chicago, chairman; oral anatomy, physiology and development, Isaac Schour of Chicago, chairman; oral pathology and surgery, Sholom Pearlman of Chicago, chairman.

The committees will report on the afternoon of June 11 and participants of the conference will review their suggestions. George B. Denton of Chicago is in charge of arrangements.

COUNCIL COMPLETES TOUR OF DENTAL HYGIENE SCHOOLS

The Council on Dental Education, at its May 13-14 meeting, reported that it had completed its inspection of dental hygiene schools applying for accreditation and would publish in THE JOURNAL within the next few months a list of accredited schools. Three schools in their first year of operation and one school with which inspection dates could not be arranged have not been considered.

The committee on dental specialties announced that its proposed workshop would discuss the need for programs of advanced dental education which would prepare graduate students sufficiently for examination by specialty boards. Officials of the approved boards and representatives of institutions which offer or plan to offer programs for the education of specialists will be invited to participate.

The Council considered the draft laws which refuse to defer dental interns and residents. The resulting resolution puts the Council on record as stressing the importance of dental internship and dental residency educational programs "for the training of diplomates of the dental specialty boards, for the training of research workers in the field of dentistry and for supplying dental school teachers."

Foreign credentials were also discussed. The Council hopes to learn more about foreign schools, their individual curriculums and faculties, in order to answer inquiries from United States schools which have been approached by foreign dental graduates desiring advanced education, according to Bert L. Hooper, Council chairman.

VA OUTPATIENT DENTAL CARE REVIEWED AT COUNCIL MEETING

The future of the Veterans Administration's outpatient dental care program was discussed by members of the Council on Federal Dental Services, officials of the VA, Armed Forces and USPHS and representatives of veterans' organizations at the May 3-4 meeting of the Council in the Central Office.

Conference participants discussed the basis on which the limits of service-connected dental conditions could be redefined in strict adherence to the federal government's obligation to veterans—the correction of diseases and injuries incurred in service.

The threat of a severe reduction in Congressional appropriations for the VA program has underlined the Council's previous appeals for a re-evaluation of the extent of the program.

The Council stressed that the federal government's obligation should not include, as it does under present regulations, maintaining a tooth or teeth after the service incurred condition of that tooth or teeth has been treated and adequately checked or corrected.

The VA Dental Service was represented at the conference by John Fauber, Harold L. Dute and Francis Gorman; the dental division of the Public Health Service, by John Knutson and James Lewis.

Representing the Armed Forces at the conference were: Maj. Gen. Walter D. Love and Col. Samuel R. Haven, Army Dental Corps; Rear Admiral Daniel W. Ryan and Capt. Clay Boland, Navy Dental Corps, and Brig. Gen. Marvin E. Kennebeck, Air Force Dental Service.

The Council also conferred with T. O. Kraabel, director of the American Legion's National Rehabilitation Commission; H. D. Shapiro, senior medical consultant of the Commission, and John C. Ward, an official of the AMVETS.

Dental Societies

WISCONSIN DENTAL SOCIETY SCHEDULES 1954-57 MEETINGS

Annual meetings of the Wisconsin State Dental Society were scheduled for the next four years by the Society's House of Delegates at its recent annual meeting in Milwaukee.

The dates adopted are as follows: 1954,

An annual tradition was renewed at the April meeting of the New Orleans Dental Association when Loyola University student members of the American Dental Association acted as hosts and presented a program of clinics. Above, clinics of the department of anatomy concern structures in the floor of the mouth and in the infratemporal fossa. Inset, are (l. to r.) the Rev. William O'Leary, S. J., regent of the School of Dentistry; Gerald Halker, president of the Loyola chapter of the A.D.A.; Prescott Smith, president of the New Orleans Dental Association, and Frank Houghton, dean of the School of Dentistry.

The newly-elected officers of the Montana State Dental Association are shown at its recent Golden Anniversary meeting, which was held May 7-9 in Missoula, Mont. They are: Ray D. Curry of Dillon, president; Stanley T. Dohrman of Great Falls, president-elect; Donald J. Elder of Miles City, vice-president, and Ernest G. Vedova of Roundup, secretary-treasurer.

April 20-22; 1955, April 25-27; 1956, April 9-11; 1957, April 29-May 1.

Official meetings of the Society are held at the Hotel Schroeder, Milwaukee, and scientific sessions at the Milwaukee Auditorium.

MONTANA DENTAL ASSOCIATION OBSERVES 50th ANNIVERSARY

At the Golden Anniversary Banquet of the Montana State Dental Association, which took place May 7 in Missoula, Mont., awards were presented to three 50-year members by Robert G. Murphy, president of the association.

The three are Bernard J. Keenan of Butte, Oscar A. Kenck of Augusta and D. J. MacDonald of Anaconda, Mont., who have been members of the state organization since its founding.

The operetta *Showboat* was presented by the School of Music, Montana State University, for the entertainment of banquet guests. Souvenir programs contained duplications of 1903 pictures, advertisements, news items and a menu.

Guests at the banquet included Otto W. Brandhorst, president of the American Dental Association, who presented an address; C. S. Renouard of Butte, trustee for the Eleventh District, and Harold Hillenbrand, secretary of the Association.

National Defense

JUNE DRAFT CALL OF 345 TO INCLUDE 42-YEAR-OLDS

The June call-up of 345 dentists will include men up to the age of 43, it has been announced by the Selective Service System. As this is the last monthly call-up before the expiration of Public Law 779, the 345 registrants will be called early to complete their induction by July, when there might possibly be no covering legislation, it was announced.

DENTAL SENIORS ADVISED TO REGISTER ON GRADUATION

The Council on Federal Dental Service has issued the following bulletin for the benefit of graduating dental students:

All dental graduates of the 1953 class who are not members of Reserve components are required to register with the Selective Service System within five days of receipt of their degrees, despite the fact that they previously may have been

registered under the regular registration provisions of Selective Service.

"Many dental seniors are unaware that they are legally required to register as dentists upon graduation, even though they are regular registrants under Selective Service laws," stated Bernard J. Conway, secretary of the Council on Federal Dental Services.

MANUAL ON CIVIL DEFENSE FOR DENTISTS AVAILABLE

The new Federal Civil Defense manual, *The Dentist in Civil Defense,* is now distributed and is available to dentists, dental societies and others who are interested. A supply has been sent to each regional F.C.D.A. office and to each State Civil Defense Office, where individual copies may be obtained under the order number TM-11-9.

Dental societies may purchase copies in any quantity from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C., at a cost of 15 cents each. In lots of 100 or more the cost will be reduced 25 per cent.

DEFENSE DEPARTMENT GROUP TO STUDY DEPENDENT CARE

The conditions under which the dependents of servicemen should receive medical and dental care from the Armed Forces physicians and dentists is now being studied by a commission recently appointed by the Department of Defense.

The Citizens Advisory Commission on the Medical Care of Dependent Military Personnel is headed by Harold G. Moulton, former president of Brookings Institution, chairman. Commission members are Thomas I. Parkinson, president of an insurance company; George W. Bachman, staff member of the Brookings Institution; Lewis W. Jones, president of Rutgers University, and Mrs. Eugene Meyer, wife of a Washington publisher.

The Association has opposed the unwarranted use of Armed Forces dentists in the care of servicemen's dependents.

Dental Education

CHARLES W. FREEMAN RESIGNS AS DEAN OF NORTHWESTERN

Charles W. Freeman, dean of Northwestern University Dental School since 1938, announced his resignation May 11 as dean; he will continue as professor of oral surgery.

Dr. Freeman has been a member of the school faculty since his graduation in 1912; he received a master of science degree in oral surgery in 1925 and became professor of oral surgery in 1933. In 1949 Dr. Freeman was elected a fellow in dental surgery of the Royal College of Surgeons, England.

He is a past president of the American Association of Dental Schools and the Illinois section of the American College of Dentists.

POSTGRADUATE COURSE COSTS JUDGED TAX-DEDUCTIBLE

A lawyer may deduct from his taxable income the costs incurred in attending postgraduate courses, decreed a U. S. Circuit Court of Appeals recently. The Court held that the costs of postgraduate courses could be classified as deductible business expenses.

A portrait of the late Walter H. Wright, former dean of the New York University College of Dentistry, recently was presented to the College by its artist, Edward Reff of Flushing, N. Y. Dr. Reff, a 1917 graduate, presented the portrait to the College in the name of his dental class. Shown at the unveiling ceremonies are (l. to r.), Dr. Reff, Mrs. Walter H. Wright, Dean Raymond J. Nagle and Emmanual Blumenthal of Brooklyn, president of the College Alumni Association. The portrait will hang in the faculty conference room of the College, now called the "Dean Walter H. Wright Room."

The Circuit Court's decision may influence the Bureau of Internal Revenue's previous declaration that expenses for postgraduate medical and dental education are a nondeductible personal item.

A bill to amend the internal revenue laws to permit professional people to deduct, as business expenses, certain educational costs was introduced in the House of Representatives April 1 by Rep. J. C. Davis (D., Ga.).

The expenses to be deducted from income would be those incurred for the purpose of "carrying on his profession, making himself better qualified for his profession, or increasing his remuneration from his profession."

DENTAL STUDENTS' LOAN FUND SET UP BY NORTH CAROLINA

The State Legislature of North Carolina has established a loan fund for junior and senior dental students, from which the students may receive loans with the understanding that they will join the staff of the state's Division of Oral Hygiene on graduation, at least until the loan is repaid.

The bill was written by State Senator Paul E. Jones of Farmville, N. C., a dentist and member of the Association's Council on Legislation. The fund will be called the "Little Jack" loan fund, in honor of the hero of a children's dental health puppet show, since "children will be the real beneficiaries," according to Ernest A. Branch of Releigh, director of the North Carolina Division of Oral Hygiene.

DENTAL SCHOOLS ANNOUNCE POSTGRADUATE COURSES

Buffalo • The University of Buffalo School of Dentistry announces that its department of orthodontics will be located in the new Medical-Dental School on the campus for the beginning of the fall semester, and applications for the postgraduate course in orthodontics leading to a certificate are now being received.

Additional information may be ob-

tained by writing to the University of Buffalo School of Dentistry, department of orthodontics, 3435 Main Street, Buffalo 14, N. Y.

Columbia • Four postgraduate courses in periodontology will be offered, beginning in September, at Columbia University, School of Dental and Oral Surgery of the Faculty of Medicine.

A full-time program covering two academic years and a half-time program covering four academic years lead to a certificate of training in periodontology. Correlation of the fundamental sciences to clinic practice is emphasized.

Of the two part-time courses, one will be given one full day each week and the other will be given a half-day each week during September 23, 1953—May 5, 1954.

Further information may be obtained by writing to postgraduate division of the School of Dental and Oral Surgery, Columbia University, 630 West 168th Street, New York 32.

New York • A full-time course in periodontics and oral medicine, leading to a certificate, will be presented by the periodontics department of New York University College of Dentistry from September 1953 to May 1954. Half-time two year courses may also be arranged.

Refresher courses covering either three weeks or ten weekly sessions will also be given; introductory courses are scheduled to begin June 1 and October 8. All periodontics and oral medicine courses are under the direct supervision of Samuel Charles Miller, chairman of the department.

Inquiries regarding postgraduate training may be addressed to the secretary, postgraduate division, New York University College of Dentistry, 209 East 23rd Street, New York 10.

Pennsylvania • A 16-month course in orthodontics will be presented by Paul V. Reid at the Graduate School of Medicine, University of Pennsylvania, beginning September 9.

Clinical instruction will be given at the dental school's newly-equipped orthodontics department. The facilities of the Growth Center of the Children's Hospital of Philadelphia also will be utilized. Other collateral studies will be directed by the faculties of the School of Dentistry and the Graduate School of Medicine. Dentists who successfully complete this course may matriculate for a degree of master of dental science under the "preceptorship plan" of the University.

Further information may be obtained from the dean, Graduate School of Medicine, 237 Medical Laboratories, Philadelphia 4.

Tufts • A full-time graduate program will be offered by the Tufts College Dental School during the academic year of 1953-

Honorary membership in the University of Detroit Dental Alumni Association recently was conferred on (l. to r.) A. Alfred Nelson, Walter C. McBride, C. Taylor Hall and Lloyd Rogers. All were cited for their past contributions to the University of Detroit School of Dentistry: Dr. Nelson as director of the clinic, Dr. McBride as director of the children's division, Dr. Hall as founder and chairman of the department of oral surgery and Dr. Rogers as associate professor in oral surgery, chief of oral surgery and president of the Board of the Receiving Hospital.

54. Courses lead to a certificate of accomplishment or to the degree of Master of Science or Master of Dental Science.

Courses leading to a certificate emphasize clinical training and require a minimum of one year of study, but may be continued longer to meet the requirements of specialty boards.

Courses leading to either Master's degree stress basic science and also provide clinical experience. A minimum of 18 months in residence is required for the Master's degree.

The courses to be offered and their instructors are: oral pathology, Irving Glickman; oral pediatrics, Frederick Shiere; oral prosthetics, Irving R. Hardy; oral surgery, Daniel J. Holland; orthodontics, Herbert I. Margolis; and periodontology, Irving Glickman.

Applications are now being accepted. Further information may be obtained from the director of graduate and postgraduate studies, Tufts College Dental School, 136 Harrison Avenue, Boston.

Public Health

TENNESSEE DENTAL SEMINAR TO VISIT EIGHT CITIES

John W. Geller of Indianapolis and Albert G. Richards of Ann Arbor, Mich., will be the principal speakers at the eleventh annual postgraduate dental seminar conducted by the Tennessee State Dental Association in cooperation with the Tennessee Department of Public Health.

The seminar program is scheduled to be presented in eight Tennessee centers during July 6-31. Dr. Geller will speak on dental prosthetics, and Mr. Richards, on dental radiography.

Information on the program may be obtained by writing to the Tennessee State Dental Association, 902 Bennie Dillon Building, Nashville, Tenn.

DENTAL PUBLIC HEALTH BOARD ANNOUNCES EXAMINATION

The second certifying examination of the American Board of Dental Public Health will be held September 24-25 in Cleveland. Applications for admission to the examination should be submitted not later than June 25 to the secretary of the Board, Philip E. Blackerby, Jr., 250 Champion Street, Battle Creek, Mich.

TENNESSEE ALLOCATES $300,000 TO DENTAL PROGRAM

The sum of $150,000 per year for the next two years has been appropriated by the Tennessee legislature for a state dental health program, it is reported by Carl L. Sebelius, director of the Tennessee dental hygiene service.

The appropriation was voted after the Tennessee Department of Public Health outlined a dental program which could be conducted if the requested $150,000 per year were allocated. The plan includes provision for a topical fluoride program, promotion of water fluoridation, bitewing roentgenograms for school children, lactobacillus diagnostic service and other preventive dentistry services. Dental health education, an externship program and research projects are also proposed.

An educational program to familiarize legislators with the need for state support of dental health was conducted during the past year by the Tennessee State Dental Association's Committee on Legislation, under the chairmanship of James J. Vaughn, Sr., of Nashville.

TULSA COURT REFUSES FLUORIDATION INJUNCTION

The way has been cleared for fluoridation of the water supply of Tulsa, Okla. On April 10 the district court in Tulsa refused to grant an injunction sought by several opponents of fluoridation who

contended that the measure would violate the constitutional rights of those who oppose it.

The Tulsa City Council had voted March 6 to institute fluoridation, but the appeal for an injunction had delayed its inauguration, reports Fred E. Sims of Tulsa.

SCHOOL ACHIEVES RECORD OF 25 CARIES-FREE CLASSES

The St. Paul Lutheran School of Melrose Park, Ill., a suburb of Chicago, has achieved a unique dental health record. Its 1953 class is the school's twenty-fifth consecutive class to be graduated with caries-free teeth.

Since 1929, when the first caries-free class was graduated, the elementary school has received an achievement award from the Illinois State Department of Public Health. In the early years of the project, Lon W. Morrey of Chicago acted as the official dental examiner and until 1948 presented the state certificate to the graduating class. In 1931, P. A. Topel of Oak Park, Ill., assumed responsibility for dental surveys throughout the grades and has served in this capacity since that time. Dr. Topel is a graduate of the school.

In recent years the presidents of the Chicago Dental Society have presented the state award to the school at commencement time.

International

F.D.I. ANNOUNCES OFFICERS OF 1957 DENTAL CONGRESS

Prof. Giovanni Corradi of Rome has been appointed Secretary General of the XII International Dental Congress of the Fédération Dentaire Internationale, which will be held during the summer of 1957 in Rome, Italy.

The organizing committee of the Congress, which held its first meeting recently, also announced that the scientific committee of the Congress will be headed by Prof. B. De Vecchis, director of the dental clinic of the University of Rome, and Prof. A. Benagiano, director of the Eastman Dental Institute of Rome. Professor De Vecchis will be chairman of the scientific committee and Professor Benagiano, vice-chairman.

The Italian Dental Association (A.M.-D.I.) has advanced 1,200,000 liras as a financial contribution to enable the organizing committee to start its work.

PRESIDENT OF INDIA APPOINTS INDIAN DENTISTS TO STAFF

The President of India has appointed two well-known dental leaders to his personal staff as his honorary dental surgeons. They are N. N. Bery and M. L. Soni of New Delhi. Their appointment was announced recently by the Ministry of Health of India, which noted that this is the first time such appointments have been made.

GREEK DENTAL SOCIETY PLANS OCTOBER CONGRESS

Members of the American Dental Association have been invited to participate in the first Panhellenic Congress of the Stomatological Society of Greece, which will be held October 25-30.

The aim of the Congress will be "to bring to the knowledge of the Greek dentists the latest attainments of dental

science," reports B. Stefanopoulos-Vrettos of Athens, president of the Society.

Information on the Congress may be obtained from Dr. Stefanopoulos-Vrettos, 71, Skoufa Street, Athens, Greece.

INTERNATIONAL ASSOCIATION OF DENTAL STUDENTS FORMED

Dental students of ten European countries have formed the International Association of Dental Students, which was formally established in Marburg, West Germany, on March 28.

The ten countries whose dental school societies are represented in the new organization are: Belgium, Denmark, Eire, Finland, France, Germany, Great Britain, Holland, Norway and Sweden. The first issue of the organization's quarterly, *Journal for Dental Students*, is now being issued.

Officers include Knut Wersland of Oslo, Norway, president; Malcolm Naylor of Birmingham, England, and Frans A. M. Schroder of Utrecht, Holland.

CARE RESUMES BOOK DELIVERY TO KOREAN SCHOOLS

The College of Dentistry of Seoul (Korea) National University will receive $900 worth of new dental books sent by the United Nations' Korean Reconstruction Agency through CARE, which is now resuming this service.

The dental books, which include 146 titles specifically requested by the school, are part of $150,000 worth of new books that CARE is shipping to war-depleted Korean universities for UNKRA. More than 90 per cent are American books; the rest are English, French and German.

Dentists may contribute to the book fund for Korean universities at any CARE office. Donors may designate the category of books they want to send and may designate the recipient school or ask CARE to choose the recipient.

ITALIAN DENTAL CONGRESS TO MEET IN OCTOBER

The twenty-eighth Italian Congress of Stomatology, sponsored by the Italian Dental Association (A.M.D.I.), will be held October 13-17 in Bari, Italy.

Three general symposiums will be featured: focal dental infection, to be discussed by Prof. M. Lusena of Milan and Prof. B. Mela of Turin; economic and social handicaps arising from dental caries, by Prof. G. Briasco and Prof. L. Molfino of Genoa; fixed prosthesis, by F. Strini of Rome and G. Zuccoli of Florence.

Further details on the congress and its dental exhibition may be obtained by writting to Congresso Italiano di Stomatologia, Palazzo Ateneo, Bari, Italy.

Research

RESEARCHERS REPORT FLUORIDATION HARMLESS

Analysis of the ribs and vertebrae of 85 men and 73 women who had lived all their lives in a city with fluoride-deficient water has shown that fluoride concentrations in bones increase with age, it was reported April 7 by three research scientists of the University of Rochester medical school.

"If all fluoride in drinking water containing one part per million fluorine were to be deposited in the skeleton, the situation would be perfectly safe," concluded Frank A. Smith, Dwight E. Gardner and Harold C. Hodge in a paper entitled "Age Increase in Fluoride Content in Human Bone," which was delivered to the Federation of Societies for Experimental Biology.

General

INSTITUTE TO TEACH CARE OF RHEUMATIC HEART PATIENT

An annual institute on rheumatic fever, to which dentists have been specifically invited, will be presented by La Rabida Sanitarium of Chicago for the first time Ocober 12, it has been announced by Hugh McCulloch, chief of staff.

The institute, which is planned to be educational in character, will cover the subject of rheumatic heart disease and will include scientific sessions on the dentist's role in safeguarding the heart patient.

Advance registration will be required for those who wish to attend the institute. Further information may be obtained by writing to Institute, La Rabida Sanitarium, East 65th Street and South Shore Drive, Chicago 49.

ORAL PATHOLOGY BOARD PLANS CERTIFICATION EXAMINATION

Certification examinations will be conducted by the American Board of Oral Pathology September 27 at the Institute of Pathology, Western Reserve University, Cleveland, it has been announced by Donald A. Kerr of Ann Arbor, Mich., president of the Board.

Inquiries may be addressed to Paul E. Boyle, secretary-treasurer, 4001 Spruce Street, Philadelphia 4.

MEDICAL LIBRARY INDEXES 44 FOREIGN DENTAL JOURNALS

Yearly subscriptions to the *Current List of Medical Literature*, issued by the Armed Forces Medical Library, are now being offered for $12. The *Current List*, published monthly, indexes 44 foreign language dental journals and includes dental titles from nondental journals in its title and subject indexes.

Basil G. Bibby of Rochester, N. Y., represents the dental profession on the Advisory Committee of the Armed Forces Medical Library, which publishes the *Current List*. "The use of this publication and *Index to Dental Literature* provides the student of dentistry with almost complete coverage of the world of dental literature," reports Dr. Bibby.

PIONEER PERIODONTIST, CELIA RICH, DIES

Celia Rich of Nashville, Tenn., veteran periodontist and dental leader, died April 12 at the age of 75.

Retired since 1952, Dr. Rich had been a civic and professional leader for more than 50 years. In 1922-23 she was the first president of the National Association of Women Dentists and in 1944 was president of the Nashville Dental Society.

Celia Rich

A graduate of Vanderbilt University dental school in 1898, Dr. Rich completed her specialty training at the University of Michigan dental school and practiced in Nashville continuously during 1899-1952. She was a member of the American Academy of Periodontology, Omicron Kappa Upsilon and F.D.I., and she formerly served as associate editor of the *Journal of Periodontology*.

Capt. Curtiss W. Schantz, DC, USN, fleet and force dental officer, is shown welcoming his daughter, Lt. (j.g.) Patricia Schantz, WAVES, USN, to the Commander Service Force, U. S. Pacific Fleet, Pearl Harbor, T. H. Capt. Schantz has been fleet and force dental officer since July 1951; Lieutenant Schantz was recently transferred to Pearl Harbor, joining her father for the first time in her three-year Navy career.

DRUG COMPANY DISCONTINUES SALE OF DENTURE RELINER

The Walgreen Drug Company with main offices in Chicago and chain stores in most of the principal cities in the Middle West recently discontinued the advertisement and sale of denture reliner material in the interest of public health. The decision was reached after a conference between representatives of the Company and officials of the Chicago Dental Society at which time it was pointed out that the use of denture reliner material by the patient might prove detrimental to both the wearer and the appliance. It is reported that the Company's gross sales from this item amounted to about $40,000 per year.

ALPHA OMEGA ANNOUNCES HEADQUARTERS FOR CLEVELAND

The Alpha Omega dental fraternity has selected the Hotel Hollenden as its official headquarters during the American Dental Association meeting in Cleveland, September 28-October 1, according to Samuel S. Cohen, East 100th Street Medical Building, Cleveland. Members of the fraternity who anticipate attending the meeting are requested to make reservations as soon as possible, Dr. Cohen announces.

INQUIRIES ON NEW GROUP ANSWERED BY ASSOCIATION

Many members of the American Dental Association who have been invited to join the International Association of Anesthesiologists, Inc., have inquired as to its professional standing.

The I.A.A. has no connection whatsoever with the American Dental Association. Although the secretary-treasurer of the I.A.A. received a dental degree in 1943, he has never been a member of the Association. He was an associate member of the American Society of Anesthesiologists, Inc., but his membership was terminated by the A.S.A. House of Delegates.

DENTISTS ASKED TO AID IN IDENTIFYING MAN

Information is being sought on an unidentified man whose body was recently recovered from the Chesapeake Bay near Richmond, Va., it is reported by S. J. Kreshover, oral pathology consultant to the office of the Chief Medical Examiner of Virginia.

Information provided by Dr. Kreshover is as follows:

Unidentified white male, approximate age 45-50 years; height 5 feet 6 inches; weight 175 pounds; brown hair with gray at temples; body recovered April 9; no marks of violence on the body, but ante-mortem hemorrhage in the scalp. The impression held by the Medical Examiner's Office is that the man was a fisherman, sailor or merchant marine attired in civilian clothing. All dental restorations were silver amalgam. The portion of right maxilla not included in the photograph was edentulous.

Also . . . The Arkansas State Dental Association and the New Jersey State Dental Society, at their annual meetings in April, reaffirmed their support of fluoridation of public water supplies. . . . The merger of Merck & Co., Inc., and Sharp & Dohme, Inc., was announced April 30 by the directors of both chemical and pharmaceutical firms. The name of the combined company is Merck & Co., Inc. . . . The twelfth German Dental Congress will take place September 15-20 in Dusseldorf, in conjunction with the German International Dental Exhibition, sponsored by the dental industry of Germany. . . . Copies of the pro-fluoridation resolution recently passed by the Minneapolis District Dental Society were sent to President Eisenhower, the governor, health director, Senators and Representatives of the state of Minnesota and Secretary Oveta Culp Hobby of the Department of Health, Education and Welfare. . . . The 1953 meeting of the American Academy of Pedodontics will be held June 24-26 at Louisville, Ky. Information on the program may be obtained from R. M. Erwin, Jr., 911 Selling Building, Portland 5, Ore. . . . *Redbook* magazine for June 1953 contains an article on fluoridation by Dorothy M. Johnson entitled "Can We Give Our Children Better Teeth?" In addition to presenting the benefits of fluoridation, the article tells how citizens can help to bring about the adoption of the health measure in their communities.

The Reader Comments

THE JOURNAL *devotes this section to comment by readers on topics of current interest to dentistry. The editors reserve the right to edit all communications to fit available space and require that all letters be signed. Signatures will be deleted before publication at the request of the author. Printed communications do not necessarily reflect the opinion or official policy of the Association. Your participation in this section is invited.*

The Editor

SERVICING A FLUORIDATING MACHINE*

Is it possible for a workman at a machine that adds fluoride to a city's supply to inhale enough of the chemical to contract toxic hepatitis? A workman has noted browning of all his teeth since he has worked near this machine during the past six months.

This inquiry was referred to two consultants, whose respective replies follow.

ANSWER.—There is no reason to suspect that toxic symptoms will develop in a workman servicing a fluoridating machine in a water plant, if ordinary precautions are followed. Under recommended procedures of the American Water Works Association[1] it is stated, with respect to application of fluoride, "7.2. Special precautions must be taken to protect the operators from inhaling fluoride dust when charging the hoppers of the feeders. It is recommended that dry feeders be equipped with dust collectors consisting of bag filters operating under positive air pressure and vented to the outside. Each operator who handles fluoride should be provided with his individual toxic-dust respirator to be used only when handling the chemical." The browning of all of the teeth is not due to possible inhalation of fluoride dust. Endemic dental fluorosis is a developmental defect, a hypocalcification or hypocalcification and hypoplasia, that occurs during the period of tooth calcification. In areas with water of high fluoride content, persons with moderate or severe hypocalcification may get posteruptively a brown stain. The hypocalcified condition of the enamel is, however, a prerequisite for the development of the brown stain. Dental fluorosis or mottled enamel never develops in a person moving into an endemic area after the teeth have formed and erupted.

ANSWER.—This inquiry has nothing to do with the physiological action of fluoride on the consumers of water in the area mentioned. The question, "What will the effect be on the man who adds fluorides at the water works to prevent caries in the children of a community?" was bound to arise. The situation already has been faced. Zufelt[2] has made various determinations at a water works plant. He found in the general atmosphere 0.025 to 0.134 mg. of fluoride per cubic meter of air for routine operations. The commonly accepted allowable concentration is 2.5 mg. per cubic meter; however, at the immediate time of dumping barrels of fluoride into a hopper, the atmosphere concentration reached 8.89 mg. per cubic meter. The urine of water works plant workers varied from 0.1 to 1.58 mg. of fluoride per liter of urine. The upper limit of safety is about 2 mg. per liter. In the instance described, no information is furnished about frequency and length of exposure and concentration of the dust. Damage to the liver is possible but is far less common than nephritis. Many fluoride-exposed workmen complain of pain in the liver region in the absence of a demonstrable pathologic condition. If the conditions of work are still suspected, many examinations might contribute information; these would include roentgenologic examination of bones (ribs, spine, and pelvis) for indications of osteosclerosis, determination of urine fluoride level, determination of atmospheric fluoride, and dental examination to determine whether the fluoride mottling was actually a recent occurrence.

*Reprinted from J.A.M.A. 151:1154 March 28, 1953.

1. J. Am. Water Works A. 41:575 July, 1949.
2. Water and Sewage Works 97:335, 1950.

THE DENTAL-MEDICAL DRAFT

The dental and medical draft, organized by the Truman forces in 1950, smells badly of a reprisal for the antisocialized medicine stand that these two groups took.

The dentist and physician must study from six to ten years in school, during which time

they spend from $10,000 to $15,000 in the completion of their respective courses. They lose earnings that could be counted from $15,000 to $25,000 during these years. They spend $4,000 to $10,000 in opening an office, plus two to three years starving to meet overhead!

At this point a dentist or physician is potentially $25,000 to $45,000 behind the person who did not attend the professional schools; and what happens? Military officials claim his service. They disregard age (up to 51), they disregard the number of dependents (up to 5), they disregard the years of study, the loss of money, the hard work to build up a practice—and compensate the professional man with three to six hundred dollars a month.

What of the practice and office—close it for two years and then come back—to starve again for more years of rebuilding? Do they pay rent on office or storage? No! Do they pay for the loss of time? No! Do they pay a reasonable amount for the health services they demand? No! You're in and that's that.

What of the other professions—why aren't they touched—the osteopath, the chiropodist, the optometrist, the chiropractor, the naturopath, the unethical dental technician, the faith healer and the witch doctor? Why are they left behind? They are left behind to take from the professions of dentistry and medicine the return that is due them after years of work and hardship.

It is time that some realistic legislation be introduced. Place the dentist and doctor in the army on a piece-work basis—pay them per filling or per treatment—let them earn what they did in civilian life. They worked for it. If this were the case, only one third of the medical and dental forces would be necessary today and professional men with age, children and physical disability would cease to make a laughing stock of the army. Is America really hard up? A country spending billions abroad can't spend money to build dental and medical schools. Wake up America and let's find the fair answer to this problem.

John P. Kalin, D.D.S., Chicago

DENATURED FLOUR AND DENTURES

I was so impressed by the arguments regarding the questionable value of white flour published in the editorial columns of the February 1953 issue of *The Dental Practitioner*, Bristol, England, that I hope it can be called to the attention of every dentist in the United States. America's mania for denatured flour may well contribute to our untimely need for dentures. The editorial reads:

"With the lifting by the Government of the subsidy on flour (among other commodities), it behooves the Dental Profession to add a word of advice to patients when discussing with them the subject of diet. Apparently it will mean that a new whiter loaf will be available to the public for those who like this type of bread. The "national" loaf will still be on sale with a wheat extraction rate of 80 per cent, while by pre-war standards the whiter loaf will have an extraction rate of 72½ per cent. The lowering of the extraction rate of wheat means that some of the food value will be lost. However, in a resourceful civilized community, this will be made up artificially by the addition of certain chemicals (riboflavin and nicotinic acid). It is always civilized to remove the natural goodness of foodstuffs and replace them artificially with chemicals. This is the progress of our modern times.

"On the question of bread it has been said that the low extraction rate of wheat merely leaves "a vehicle for starch." Bread is an easy form of food to give to children, a good slice of bread and butter and the child may be sent into the back yard and out of the way. The growing child needs protein, which of course has been removed from the bread and given to the animals of the field. The manual worker who returns home at the end of the day and sits down to a meal of all the week's meat ration and gives the children bread and butter has got things the wrong way round. It is he who needs the bread and butter for his energy, while the child needs the protein. But despite all the chemicals that may be added to the new bread; it does not lessen its caries-producing potentialities; in fact they are increased.

"Mothers who have children who develop rapid caries would be well advised to give them a high-wheat-content type of bread, or, better still, bread made of whole wheat, which from a point of view of health is best. It is realized only too well that to tell people not to eat the things they like is usually useless, but the dental surgeon can point out to his patients the need for a carefully balanced diet, particularly in children. If new whiter bread is eaten, it is all the more important to ensure that the sticky mass clinging to the teeth after this type of food should be removed with a toothbrush as soon as possible. There is no substitute for the natural foods of the earth, but if the goodness has been removed and replaced artificially by chemicals (though why this has to happen nobody knows), then double care must be taken of the oral hygiene."

J. C., D.D.S., Chicago

NEED FOR DENTAL CARE PLAN FOR INDIGENT CHILDREN

The battle against socialized dentistry took a turn for the better on November 4. And so it appears that the right to free enterprise will now be upheld. The dignity of the individual, including the dentist, will be respected.

But how about the dignity of a certain individual whose heritage is indigence by reason of God's blessing him with a large family? He cannot raise his children as he pleases; he cannot purchase dental care for his brood as he would like, simply because his modest income must be spread too thin.

If democracy is to progress, much attention and study should be devoted to these families who have four or more children. Income tax deductions are not enough. These children are our children. They belong to God. And because they belong to God in a sense they belong to us.

Children from large families have as great a right to good dental care as do those from homes with one, two and three children. The law here is not constitutional; it precedes that; it is moral. Dignity, charity, justice, love of thy neighbor are only a few words, but they are enough to inspire us.

Our Association has spent much time, effort and study in opposing socialized dentistry for the good of our country, but also for the good of its organized dentists. Now is the time to spend time and effort on the subject of dental care for the good of needy children.

I don't know the answer, but I know something should be done. We cannot stall. If we do, by our silence we are begging for socialism in the dental profession.

The boy of today from a large family goes to the Korea of tomorrow. He will defend our country and may lay down his life for you and me, even if we have no sons of our own to match him on the battlefield. For that reason, if for no other, we should see to it that he has the dental care which he requires in his boyhood days if he comes from a home which cannot provide the ordinary things of life.

It appears to me that after some sound thinking our Association should formulate and make public a plan which represents the dentist's viewpoint. We should make some suggestions, even though they may not be accepted.

The time to do the thinking is now, before another election could tell us that we had our chance and muffed it.

J. C. O'Donnell, D.D.S., Iron Mountain, Mich.

Book Reviews

SIDE EFFECTS OF DRUGS

By L. Meyler. 260 pages of text, with 20 pages of introduction, table of contents and index. No illustrations. Price $5.50. Amsterdam, Elsevier Publishing Co., 1952. English translation.

The volume of source material which was utilized in preparing this book is indicated by the 1,807 references to the original literature in its bibliography. The book is essentially a comprehensive but highly condensed annotated review of the literature. Many of the references are to recent publications.

The relative frequency of occurrence of various side reactions often is not clear from the text. Their treatment is described only occasionally. In some instances, it is not clear whether a close investigation of original sources of information would actually reveal a cause and effect relationship involving the drug. Treatment of the subject matter is primarily inclusive rather than highly critical.

More than 100 pages are devoted to side effects of the metals, sulfonamides and antibiotics. About half of the book deals with drugs which are used at least occasionally by dentists. It should be interesting reading and a useful handy reference text for dentists as well as for others who are concerned with drug actions.

Donald A. Wallace

A MANUAL OF ORAL SURGERY

By W. Harry Archer. 626 pages with 1,036 illustrations. Price $15. Philadelphia, W. B. Saunders Co., 1952.

The subtitle, "A Step-by-Step Atlas of Operative Technics," is a good description of this voluminous text which begins with 154 pages and 257 illustrations on the extraction of teeth. This is an excellent presentation and could well serve as the principal guide to the beginning student or to the practitioner in need of refining his technical procedures in tooth extraction. Especially well done are the instructions on instrumentation, the chair and finger positions and the detailed illustrations of operative procedures in difficult extractions including the removal of broken roots and impacted teeth.

While the book is primarily the work of the author, he has delegated to competent colleagues the chapters on oral malignancies, cleft palate and lip, roentgen anatomy, and some other topics. A chapter on the complications associated with oral surgery and another on oral surgery in the hospital are distinct additions to the value of the text. A chapter on oral infections and one on fractures are profusely illustrated and the treatment of cysts is well covered.

The author has produced a book which should be of very real and practical value. It can be especially recommended to the dentist of limited experience who requires an effective guide to increasing his competence in managing the many problems in minor oral surgery.

Charles W. Freeman

ANTIBIOTICS

By Sir Howard Florey. 35 pages with 22 illustrations. Price $1.50. Springfield, Ill., Charles C Thomas, 1951.

This little book is the printed version of a lecture delivered before the Oxford University Scientific Club on June 1, 1950.

The fundamentals of the bacteriology, chemistry, evaluation and manufacture of antibiotics are covered in elementary terms, suitable for a scientifically literate but not highly specialized audience. Dental applications are not mentioned.

The reader is impressed by the number of developments which are not described however, because they have occurred since Dr. Florey gave his lecture.

ZINSSER'S TEXTBOOK OF BACTERIOLOGY

By David T. Smith, Norman F. Conant, Joseph Beard, Hilda Pope, D. Gordon Sharp and Mary A. Poston. Tenth edition. 1012 pages with 330 illustrations. Index. Price $11. New York, Appleton-Century-Crofts, Inc., 1952.

This is the tenth edition of a classic American textbook which has included among its previous authors, Zinsser, Hiss and Bayne-Jones.

The present authors continue to stress the basic biologic approach to bacteriology and to emphasize the public health significance and practical clinical importance of certain of the biologic characteristics of the organisms.

This edition contains 132 new illustrations and references to literature through 1951 into 1952.

There has been some revision or rewriting of each section, but the greatest increase in subject material is found in the section on filtrable viruses. The section on medical mycology is particularly well adapted to the needs of medical students.

One hesitates to attempt criticism of a book of this caliber but it is possible that medical students might profit by more consideration of the bacteriological problems of oral infections. For example, only single short paragraphs are devoted to the subjects of dental caries and focal infection.

Some discussion of gingival lesions is included in the eleven page chapter on "The Spirochetes of Relapsing Fever, Vincent's Angina and Other Diseases," but very few references to dental literature are included.

If this textbook is used by dental students, the instructors should be prepared to supplement their courses by lectures and assigned reference readings on dental problems.

H. T. Knighton

HEALTH RESOURCES IN THE UNITED STATES

By George W. Bachman and Associates. 276 pages. Index and five appendixes of tables. Price $5. Washington, D. C., The Brookings Institution, 1952.

This book brings together in a single, integrated compilation, significant facts on many aspects of the health picture. For anyone whose work or interest requires reference to factual information on health resources, the material will prove extremely useful.

The first section of the book presents facts on mortality and morbidity as a measure of the health of the nation. The second part is an inventory of health personnel. The third and largest part is entitled "Facilities and Services." It deals with hospitals, government medical departments, health service in industry, and the various public and private programs designed to control specific diseases.

Four pages are devoted to a discussion of the number and geographic distribution of dentists, age of dentists, number of dental schools and students, specialists, and sex and race of dentists. The appendix contains tables showing the distribution of dentists, dental schools and students by state, average age of dentists by state, and the number of persons dentally ill reported in two morbidity surveys.

Fluoridation of public water supplies is discussed as an example of an environmental control program which contributes to the promotion of health. Included is a table showing, as of July 15, 1951, the number of communities fluoridating, the number with fluoridation approved but not begun, and the number of public water supplies in each state.

A 1951 survey of industrial health programs by the National Association of Manufacturers showed that out of 3,549 companies, 84 provided some kind of dental care to their employees. However, although only 2.3 per cent of the companies had dental programs, these covered 10.5 per cent of all employees, because more of the larger plants had such programs. In a 1950 survey of 569 industrial plants made by The Brookings Institution with the cooperation of the American College of Surgeons, 63 indicated they employed dentists.

Inasmuch as this study covers virtually all health professions and semi-professions, the coverage of any one profession is necessarily limited to salient points. In the discussion of dental personnel, no mention is made of the important part played by dental hygienists, technicians and assistants in the provision of dental care to the American people. In the evaluation of the health of the nation, no mention is made of the incidence of dental disease. As an extensive rather than an intensive study of health resources, however, for many people this book will be of great value.

B. D. Moen

ODONTOLOGICA. FASC. 1: ÜBER HERKUNFT UND BEDEUTUNG DER SPEICHELKÖRPERCHEN. FASC. 2: ÜBER DENTINIMPRÄGNATION. FASC. 3: ÜBER DIE ANWENDUNG DES LACHGASES IN DER KONSERVIERENDEN ZAHNHEILKUNDE

Edited by Oskar Müller. Three small volumes, 117 pages with 112 illustrations. No price listed. Basel, Switzerland, Benno Schwabe and Co., 1952.

The first of these volumes of "essays from the entire field of dentistry" deals with the source and significance of saliva corpuscles. The author, Dr. Roland Petzold, on the basis of saliva counts and microscopic studies of saliva constituents, draws the following conclusions: (1) The normal count of saliva corpuscles is from 200 to 700 per cubic millimeter. In an individual during a single day there are immense differences in counts. (2) Various psychological and physiological factors influence the saliva count; one of the most potent in raising the count is hunger. (3) Experiments with counts before and after

tonsillectomies failed to show any correlation. (4) The saliva corpuscles, acting as phagocytes, undergo various transitions, appearing at times with a round nucleus, at times with a divided nucleus; at all times the corpuscles have a peroxidase reaction. (5) The granules in the protoplasm of the saliva corpuscles contain a special ferment which plays a role in digestion and attacks bacteria.

In the second volume, "concerning impregnation," the author, Dr. Karl Gisler, declares that the goal of the dentist today is the exact opposite of his goal in the past: where once the dentist proceeded directly to the devitalization of the pulp, now he works on the principle that as long as a tooth has any vitality whatever it must be kept alive. An impregnation medium of zinc chloride-potassium ferrocyanide has given good results in the treatment of deep caries and of supersensitive dentin.

In the third volume, "concerning the use of nitrous oxide in conservative dentistry," the author, Dr. Fritz Eichenberger, recommends the employment of "relative analgesia" for the tasks of conservative dentistry, especially for cavity preparations. The information necessary for a dentist's successful employment of nitrous oxide is outlined briefly and includes the physiological functioning of the gas, the symptoms of analgesia, the classification of patients, technic in using the apparatus by the patient control method and by the operator control method, practice in the use of the gas. Experience in the use of nitrous oxide for 78 cases is summarized. Various opinions expressed in current literature as to the use of nitrous oxide in dentistry and the indications and contraindications for its use are presented briefly.

Grace Nichols

THE GINGIVAL POCKET—ANATOMY, PATHOLOGY, DEEPENING AND ELIMINATION

By J. Waerhaug. Odontologisk Tidskrift, Volume 60, Supplementum 1. 186 pages, with 83 illustrations. No price listed. Oslo, Norway, Reistad and Sons Boktrykkeri, 1952.

In this book the generally accepted theories on the mechanism of the epithelial attachment are surveyed, together with the experimental work on which they are based. The author's own investigations include observations on human autopsy material, histological sections, dissection of fresh unfixed jaws of dogs, foxes and rats, biopsy dissection of human material, clinical observations on children and the microscopic examination of extracted teeth and artificial crowns. The reaction of the pocket epithelium to the insertion of india ink and infected plaque material and the relation between subgingival calculus and the bottom of the pocket were also studied. Further investigations were made to test the possibilities of reattachment of the periodontal membrane to the tooth, and the inadequacy of different scaling instruments for the removal of subgingival calculus.

Dr. Waerhaug satisfactorily establishes the general conclusion: that a physiologic pocket extending to the cemento-enamel junction is formed upon the eruption of the tooth. Evidence such as the fact that the one or several layers of epithelial cells may be found on the surfaces of extracted teeth, should not be interpreted as proof of an organic union, inasmuch as their hold was so weak that it was possible to wash them away with a tiny jet of water. Again epithelial cells were shown to adhere to surfaces of artificial crowns which have been in contact with the gingiva. Inasmuch as their attachment to the artificial crown seems to be of the same strength as that of the so-called "epithelial attachment" and their appearance is also the same, the presumption that they are also attached in the same manner seems to be justified.

A secondary cuticle was shown to have developed on the surface of calculus, artificial crowns and root filling materials. All these factors quite obviously point to the fact that histological evidence alone is insufficient to establish the existence of an organic union between the so called "epithelial attachment" and the tooth surface. Hence, lacking evidence that a real growing together of the so-called "epithelial attachment" and the tooth occurs, the union may be more satisfactorily explained as an adhesion or (better) an agglutination of surfaces.

Such a presumption permits of many possibilities in treatment procedure. (1) The physiologic pocket was found to be sterile and contained no subgingival calculus. (2) A pathologic pocket is present when contaminated deposits of calculus are found below the gingival margin. (3) Complete removal of subgingival calculus can result in the development of a sterile physiologic pocket. (4) It was found to be technically possible to obtain as favorable conditions around an artificial crown as around a natural tooth.

The possibility of reducing the depth of a pathologic pocket by subgingival curettage was theoretically found to exist; however, until further proof has been produced, its practical value has been questioned. Conditions required for reattachment of artificially produced pockets were found to be different from those for pathological pockets.

The findings cited seem to call for a reconsideration of programs of treatment in periodontics that are predicated upon the existence of an actual organic "epithelial attachment" that is a growing together of tooth and epithelium in contradistinction to those suggesting an adhesion or agglutination of surfaces.

G. R. Lundquist

PSYCHIATRY AND MEDICAL EDUCATION—1951 CONFERENCE

Report by the American Psychiatric Association. 135 pages. Three appendices and index. No price listed. Baltimore, American Psychiatric Association, 1952.

This book reports on the conference on psychiatric medical education held at Cornell University, June 21-27, 1951 at the request of the American Psychiatric Association and made possible by a grant from the National Institute of Mental Health, United States Public Health Service.

Psychiatry and medical education may well become a most controversial issue in the years before us. Dentistry obviously will be influenced by divisions that eventually will take place. The essence of the controversy is contained in the program envisaged by those sympathetic to "the psychiatric infiltration method" of medical education. The proponents of this method would remove departmental separations in medical schools, to let their concept of human biology—"psychobiology"—infiltrate the entire medical curriculum.

The propositions vigorously presented in the report would have medical courses as now given in our Universities conform to this new concept of psychobiology. Everyone agrees that medical training should keep abreast of scientifically justified changes, and that some faults do exist in present-day training; nevertheless, it becomes an entirely different situation when the profession is asked to make a complete departure from its present philosophy to one that is not scientifically developed.

There is a social aspect to medicine but medicine is not sociology. Even if we acknowledge all the reasons for the medical student to further his psychiatric studies, we must realize that the core of the matter would be to change the concept of medical education to that of a social science.

The overtones of this departure are sinister. For one thing, medicine as we know it would be changed radically. In its place would emerge two systems: (1) the social sciences to which our medical men would become functionaries, and (2) medical care as it relates to the prevention of disease—envisaged by the U. S. Public Health Service as a service properly within its sphere of activity, to be applied on a community-wide basis.

Two items appear in the report which seem important to your reviewer. On page 37 it is stated, "In World War II private physicians entering the service faced a type of medical practice that was in essence—though at a different level—the very type with which the conference is largely concerned, and for which forward-looking medical education seeks to give training."

On page 102 this statement appears: "Some of those most actively concerned in the efforts to develop the teaching of psychodynamic aspects of psychiatry as a basic medical science have been keenly aware of its shortcomings as a science; they have realized the difficulties of adequate scientific validation when dealing with multiple variables in an area where experimentation is difficult, where the personal equation is so large a factor in the making of discriminating observations and the drawing of inferences, and where 'controls' are hard to keep 'controlled.' These considerations constitute serious limitations and handicaps to the scientific development of psychodynamics."

They do indeed, and it is difficult to understand how conferences such as this one will ever succeed where there exists an obvious disregard for ethical considerations.

Thomas M. DeStephano

ELEMENTARY MEDICAL STATISTICS

By Donald Mainland. 309 pages. Appendix. Price $5. Philadelphia, W. B. Saunders Co., 1952.

Possibly the outstanding feature of this book is its emphasis on the importance of proper design of experiments. The author points out repeatedly that no handling of statistical data, however technical or refined, can validate an experiment the design of which is essentially faulty. As an elementary work in statistical methodology, this book handles the subject of statistical reasoning very completely and very well.

However, if one is looking for a book which will show the most efficient way of calculating the various statistics, he should look elsewhere. The calculations of the common description statistics such as the mean, median, standard deviation and correlation coefficient, are either completely ignored or incompletely discussed.

Possibly the book tries to cover too much ground in too little space. Some of the sur-

prisingly advanced topics included in this "elementary" text are curvilinear regression, multiple regression, factorial design, incomplete block design and inverse sine transformations.

One advantage this book has for health statisticians is that the examples are couched in medical terminology. In fact, so many examples of statistical application in medicine are used that this in itself becomes an important educational feature of the book. Readers of the book will surely come to appreciate the tremendous usefulness of statistics in medicine, not only to the research worker but to the private practitioner as well.

B. D. Moen

HEALTH PROGRAMS DIGEST

By Helen Hollingsworth, Helen L. Johnston, Anna Mae Baney. 146 pages. No charge. Washington, D. C., U. S. Public Health Service, 1952.

In outline form this digest presents facts about organized programs for the provision of health services or for the payment of hospital and medical care costs. The report emphasizes programs which assist people in meeting the costs of medical care or which provide medical care directly to the individual. It also includes public health programs and programs to help improve or expand community facilities and services.

The digest is based on readily available published material. Sources are shown by reference numbers.

F. C. Cady

WHEN THE DOCTORS ARE PATIENTS

Edited by Max Pinner and Benjamin F. Miller. 364 pages. Index. Price $3.95. New York, W. W. Norton and Co., Inc., 1952.

"Seeing's believing but feeling's the truth." This old proverb keynotes the revelation of symptoms experienced by various doctors suffering from chronic disorders. It is assumed that the subjective experience of disease is more accurate than the objective. Human experience points to the contrary. Nevertheless, this series of personal experiences reveals the real feelings of the sick, their deep-seated miseries and mental sufferings. Such an insight is all the more valuable because understanding analysis and treatment of symptoms *per se* tend to be neglected in modern medicine. The patient is interested in his symptoms; the doctor in diagnosis. This series of essays bridges the gap between them.

Here the concept of symptom is greatly enlarged to mean the patient's total subjective experience caused by disease. To the commonly acknowledged symptoms such as fever, pain, fatigue and nausea are added subjective experiences on the mental, emotional, social and economic aspects of disease. There is a dual effect involved. In the one, the total personality modifies the disease and in the other, the disease modifies the personality. Both aspects must be considered in the management of disease.

In this study, there is impressive evidence that psychogenic symptoms torment the patient far more than the somatic symptoms. They may be less real than the somatic but they must be accepted on face value and treated accordingly. That means that the whole patient must be treated rather than the disease alone. Otherwise, he is bound to seek relief in pseudo-religious or fraudulent realms.

The medical contributors of these cases must have felt greatly relieved to release their three dimensional feelings on the two dimensional page, even though some use pseudonyms. The range of diseases includes heart disease, loss of sense acuity, pain, addictions, degenerative, infectious and allergic disorders and even aging.

I. Newton Kugelmass

KARIESTHERAPIE MIT SCHELLHÄRTENDEM KUNSTSTOFF

By Th. Spreter V. Kreudenstein. 99 pages with 89 figures. Index. München, Carl Hauser Verlag, 1952.

This small monograph, volume 9 of *Zahnheilkunde in Einzeldarstellungen*, is the first book in the series which deals exclusively with the properties and applications of self-curing filling materials. The first chapter (8 pages) summarizes the chemistry of these resins. Chapter two (21 pages) covers pharmacological properties, including results of the author's investigations. Chapter three (41 pages) gives an excellent account of the physical characteristics such as setting time, heat of reaction, thermal expansion, shrinkage, marginal adaptation, residual monomer content, hardness, porosity and color stability, as well as adhesive and abrasive properties. The final chapter (15 pages) discusses use of these materials in dental practice.

Thoughout the book the author has drawn on many of the studies conducted by him and his co-workers at the University of Kiel.

Experimental details of some pharmacological and physical investigations are included. Unfortunately, no American products were studied. The materials tested were of early European vintage and generally inferior to present-day resins.

The rapidly growing literature of this comparatively new field has been thoroughly reviewed. An extensive up-to-date bibliography contains 101 references. The monograph presents a valuable survey of the field for those interested in the physical and chemical properties and uses of self-curing filling materials.

G. M. Brauer

THE OLD EGYPTIAN MEDICAL PAPYRI

By Chauncey D. Leake. 108 pages. Bibliography. Index. Price $1. Lawrence, Kan., University of Kansas Press, 1952.

All students of the history of dentistry are interested in what the ancient Egyptians did in the way of care of the teeth and the treatment of dental ills. The eight medical papyri listed by Dr. Leake in his Logan Clendening Lectures on the History and Philosophy of Medicine at the University of Kansas (1951) constitute all of the written record shown on this subject. Of the numerous prescriptions and cases contained in these papyri very few are concerned with the teeth. Although Dr. Leake adds nothing to what is already known in this matter, his work gives a general perspective on the medical works which furnish the background of Egyptian dental therapeutics not to be found elsewhere.

After a general review of all the papyri, he discusses Egyptian weights and measures and drug measurements. The rest of the book deals with the content and organization of the Hearst Medical Papyrus, which is a practitioner's recipe book, of the middle of the sixteenth century before the Christian era. Only two of the recipes can be construed as referring to conditions of the teeth.

In the histories of dentistry the knowledge and procedures of the Egyptian surgeons in the field of dental practice are usually given an importance which the papyri and dental remains do not justify. A study of the papyri not only establishes the paucity of dentistry, not to say complete lack, but by furnishing a knowledge of Egyptian therapeutics in general, makes it easy to understand why dental science and art were not further developed. Dr. Leake's summary will save the student much fruitless search through more extensive works to secure the essential background facts.

George B. Denton

HEALTH SABOTEURS

By Robert William Davis, 306 pages with 47 illustrations. Index. Price $4. New York, Pageant Press, 1953.

This monograph presents the pros and cons of the tonsil and adenoid controversy. It unfolds a logical discussion of the functions of the tonsils and their relationship to other organs of the body with an incessant plea for early routine tonsillectomy. The author parallels this procedure with appendectomy as a universal cure for the death-dealing "inflammation of the bowels." He blames infected tonsils for every human disorder including cancer. Infected tonsils are apparently responsible for deformities, infectious diseases, hypertension, heart and metabolic diseases and even crime. There is no scientific evidence for this contention.

The scientific truth of the matter is that the tonsils and adenoids are normal tissues in the nasopharynx. There may be some controversy about the role of these masses of lymphatics in the defense of respiratory and alimentary tracts against invasion by pathogenic microorganisms. They play a relatively minor role in the majority of systemic disorders, and can only be suspected as secondary causes. There are always contraindications to tonsillectomy, such as blood and hemorrhagic disorders, acute infections, tonsillitis, otitis media, acute chorea, active heart disease and nephritis. Subsequently, the operation may be advisable, but clinical experience and scientific studies indicate that the early removal of tonsils and adenoids does not eliminate these diseases. To decide clinically whether the child needs the tonsils and adenoids removed requires considerable information on the child's health, history and his present complaints. In properly selected cases, the removal of tonsils and adenoids is advisable. Failure to obtain satisfactory results may be due to the haphazard methods of selecting children for the operation.

Current indications for adenoidectomy and tonsillectomy are complaints of interference with normal breathing, swallowing difficulties, susceptibility to nasal colds, ear disturbances, impaired hearing, chronic or repeated otitis media, throat disturbances such as chronic tonsillitis, peritonsillar abscess, gland disturbances such as chronic cervical adenitis, tuberculous adenitis, sinus infections such as post nasal discharge, rheumatic disturbances such as recurrent muscular pains, rheumatic fever (quiescent), family susceptibility, nutritional disturbances such as unexplained malnutrition, unexplained anorexia and cyclic vomiting.

I. Newton Kugelmass

MEDICAL BIOGRAPHIES, THE AILMENTS OF THIRTY-THREE FAMOUS PERSONS

By Philip Marshall Dale. First edition. 259 pages with 32 illustrations. Price $4. Norman, Okla., The University of Oklahoma Press, 1952.

The reader does not have to be listed among the morbidly curious to be captured by this book. In preparing these 33 short medical biographies the author dug deep and well into the best of reference material and aided by his medical education, used excellent judgment in selecting those items, incidents and activities in the life of each subject that contributed to the biographee's death. In weaving these contributing factors into a finished fabric Dr. Dale necessarily supplies his readers with much information which perhaps is more valuable because of its historical significance than because of its moribund nature.

How such noted persons as Christopher Columbus, George Washington, Lord Byron and Robert Louis Stevenson struggled against a lifetime of ill health, how the weakness of human flesh handicapped others, how the lack of modern medical skill contributed to the untimely death of many famous personages and how all of these factors influenced the course of history makes interesting and valuable reading; so interesting, in fact, that many readers will be stimulated to delve further into the excellent references listed chronologically on the last 15 pages of the book.

FOR MEDICAL WRITING

By Edwin P. Jordan and Willard C. Shepard. 112 pages with 26 figures and illustrations. Index and 7 appendixes. Price $2.50. Philadelphia, W. B. Saunders Co., 1952.

Although prepared specifically for the writer in the medical field, most of the content of this book is equally applicable to dental writing. The authors take the reader step by step through the preparation of a medical (or dental) article or book from the point of choosing the subject to its completion. The necessity for a thorough review of the literature is stressed as well as a careful planning of the contemplated study. Very pertinent advice on the actual writing of the paper is given, often in a humorous vein. An example in point is the discussion of unnecessarily complicated and obscure writing which is termed "puddery." The authors quote Quiller-Couch, who pointed out that in good writing one should not say, "He was conveyed to his place of residence in an intoxicated condition," but just say. "He was carried home drunk."

There is an excellent chapter on the preparation of illustrations and their reproduction. This chapter contains a brief discussion of the preparation of legends for illustrations and of copyright laws regarding previously published illustrations and printed material.

The authors are to be congratulated for their insistence upon the use of controls wherever possible in medical (or dental) studies and the use of statistical methods for evaluation of results. While most medical or dental authors will not attempt personally to use the statistical methods outlined in the chapter on this subject, after reading it they will be much more aware of the importance of submitting their data to the trained statistician for study. A portion of the chapter covers the use of various types of graphs as an aid in presenting statistical data.

In the appendixes the authors present several groups of data which will be of value to the medical or dental author. Included is a glossary of proofreader's marks, tables of weights and measures and transposition factors, temperature scales and conversion factors.

Unquestionably every author in the medical or dental field would profit by careful study of this publication.

F. D. Ostrander

REPORT OF THE ROCKEFELLER FOUNDATION FOR 1951

557 pages, with illustrations. No price listed. Index. Published by the Foundation, 49 West 49th Street, New York, 1952.

This Foundation makes grants and appropriations in the following fields: public health and medical science, natural science and agriculture, the social sciences, the humanities and education.

In 1951 grants to public health and medical science amounted to $3,796,270. These grants included medical education, virus investigations, malaria research and control, mental health and physiological studies as well as minor grants in other medical fields.

Of significance to the dental profession is the fact that grants and studies of dental health were not included. In all probability this is the fault of the dental profession. To the best of this reviewer's knowledge, little if any effort has been made by the dental profession to interest this rich foundation concerning the need for dental studies or research.

F. C. Cady

LES TUMEURS DES MAXILLAIRES

By MM. Bataille, Beal, Bureau, Cernea, Descrozailles, Lambert, Parant. 117 pages with 12 illustrations. Price 750 francs. Masson et cie, Paris, 1952.

This brochure consists of reports delivered at pathological conferences of the Paris hospitals. Each of the eight chapters has been written by a different author. By chapter, the study includes the following topics: tumors in general, benign and malignant, by Parant; benign tumors of the jaws exclusive of cystic formation, by Lambert; cysts of dental origin, by Beal; anterior palatine cysts, by Descrozailles; adamantinomas, by Parant; malignant tumors of the maxilla, by Bureau; malignant tumors of the mandible, by Bataille; the methods of treatment and their application to oral tumors, by Cernea.

Each chapter except the final one follows a similar pattern. It deals first with the clinical aspects of the lesion, with its roentgenographic appearance and finally with its diagnosis. Chapters devoted to the study of benign tumors end with suggestive treatments. The final chapter deals exclusively with the treatments of malignant tumors.

The most important feature of the book as a reference is probably its bibliography, because most of the authors quoted are Europeans and the majority of them are French writers. The illustrations, however, are neither too significant nor too valuable.

Rene Rochon

THE PHILOSOPHY OF PSYCHIATRY

By Harold Palmer. 70 pages. Index. Price $2.75. New York, Philosophical Library, Inc., 1952.

To the uninitiated in the realms of psychiatry, the title, alone, of this book would be enough to cause one to think twice before picking it up.

The Philosophy of Psychiatry is a book by a psychiatrist dealing with psychiatry and meant for consumption by other psychiatrists.

Palmer's basic premise appears to be that there is a demanding need for a definitive treatise on the terms used in psychiatry. And to carry this premise a step further, he feels that the specialists in his field must come to an agreement as to purpose, terminology and, virtually, method. He does, however, acknowledge the interrelation of the psychiatrist and other men of medicine in treating the "afflicted" mind.

One of the author's better arguments is that psychiatrists should be well grounded in the realm of philosophy. As he states it, "Psychiatrists should receive a training in philosophy so that the intended meaning of terms used by them shall be stipulated, and the esotericism and the ambiguities of syntax so characteristic of their specialty shall be reduced to a minimum."

With this "philosophy," I am in complete accord—and feel that Dr. Palmer should apply it to himself. For this same esotericism which the author decries is all too apparent in this very book—when read by a layman.

It is only fair to add, however, that Dr. Palmer's basic premise and "philosophy" are essentially sound—and the book should be on the "must" list for practicing psychologists and psychiatrists.

Theodore C. Levitas

PHARMACOLOGY AND THERAPEUTICS

By Charles Solomon and Elizabeth S. Gill. Sixth edition. 675 pages. Illustrations; some colored drawings. Index. Price $4.50. Philadelphia, J. B. Lippincott Co., 1952.

This book is written for nurses and students in nursing. An attempt is made to cover the entire field of pharmacology and therapeutics, as well as much of nutrition and materia medica. The form is necessarily concise. Good use is made of anatomical drawings, tables and charts.

Emphasis is upon practical applications, although much fundamental theory is included. The distribution of emphasis among the various classes of drugs and methods of treatment is sound.

Many of the newer drugs are described, but some of them, such as lidocaine, mephenesin, arterenol, isopropylarterenol and N-allylnormorphine are not.

In many instances unnecessary and confusing use of copyrighted names for drugs is avoided but exclusive trademarks still appear too frequently in the text. This practice should be avoided.

The discussion of patent medicines and self-medication in the first chapter would have been more timely ten or fifteen years ago than it is now. The Food and Drug Administration and the Federal Trade Commission with the cooperation of other agencies, public and private, have already improved some of the undesirable situations referred to in this section.

When supplemented by lectures, this text should be very helpful to student nurses. It is well written and readable.

REDUCING COOKBOOK AND DIET GUIDE

By Lewellyn Miller. Illustrated by Ava Morgan. 225 pages. Index. Price $2.75. New York, Thomas Y. Crowell Co., 1952.

This cookbook and diet guide was written to prove a point: "that dieting to lose weight need not be a dreary enterprise—tiresome, expensive and a thoroughgoing bore to family and friends." It has proved its point.

Preceding the recipes, Miss Miller has prepared several chapters wherein she does a good job of explaining why people get the erroneous idea that they have inherited the tendency to be fat. She tells also how to reduce calories while still maintaining a proper and sufficient supply of essential nutrients.

One chapter is headed "How to Eat As Much as You Want and Lose Weight." But don't let the title mislead you. You will learn that you must "want" specific kinds of foods. If you are in earnest about reducing, you will have to omit many kinds of foods and beverages. And you will discover that "want" is defined as hunger, as differentiated from appetite.

The basic rules given are excellent, except that Miss Miller still perpetuates the standard of two large glasses of milk daily, even though present research makes it clear that three glasses are needed by most adults. The menus, however, do specify a glass of skim milk or its equivalent with each meal.

For many of us, the menus and recipes are almost too elaborate for everyday use. They are more like party menus for every day. In fact, the recipes are highly recommended for everyone, reducing or not, who likes unusual foods with a cosmopolitan flavor. Small line illustrations enliven the text.

This book may assist many in overcoming the many obstacles to dieting. It is timely advice, for today overweight is a serious problem for too many adults.

Dorothea F. Radusch

PSYCHOLOGIE IN DER ZAHNÄRZTLICHEN PRAXIS

Edited by Heinrich Meng. 172 pages with 60 illustrations and a bibliography. Index. Price 23.50 D.M. Bern, Switzerland, Medizinischer Verlag Hans Huber, 1952.

The author states the purpose of this volume in the foreword: "Our collection is no textbook. It is an introduction—an orientation, a bit of advice and a guide—for the practitioner."

Whenever a patient enters a dentist's office declaring, "I am nervous," the dentist should immediately be on his guard, watching for indications of various neuroses. To treat the "nervous" patient adequately, the dentist must understand Freud's theories and the modern concept of the conditioned reflex.

The patient's attitude toward dental treatment, even toward the chair in the dentist's office, is the product both of his parents' teaching and of their attitude, frequently based on folklore and primitive superstitions, Dr. Meng states.

The dentist would do well to present to each patient who is to wear a prosthetic appliance written notes on what is to be expected of the appliance and of its wearer, the author advises. The adaptation to a prosthetic appliance is of supreme psychological significance to the wearer, he says; first because consciously or unconsciously he connects the necessity of wearing a denture with the natural lessening of his physical powers and secondly because unconsciously he has a feeling of guilt for the deception he practices on wearing a "thing against nature."

It depends to a great extent on the dentist whether the wearer, after passing through a period of difficult mental and physical adjustment, eventually accepts the prosthesis or retains a neurotic sense of shame, guilt and prejudice against it. To avoid neurotic fixation on the part of the patient, the dentist must practice infinite tact and take time and patience to orient the wearer in the necessary physical and psychological adaptation. A temporary prosthesis is of great help, especially for the "nervous" patient.

The old wives' tales of difficult dentition have no basis in fact. A children's dentist requires a special measure of understanding and patience. His office must have an atmosphere which makes the child feel at home, his assistant by simple explanation must dispel fear and give understanding, and the dentist himself must be the child's friend. Many dentists cannot qualify as children's dentists.

Patients suffering from periodontal diseases are likely to be suffering also from psychological disturbances, Dr. Meng asserts.

Many dentists have chosen dentistry instead of medicine as their life's work for financial reasons or because the medical schools were closed to them, he contends, although there are many who had a real inclination toward dentistry in the first place. Regardless of the reason for entering the profession, the majority of dentists are happy in their calling and, if given a choice, would choose it of their own volition, he says.

Grace L. Nichols

Current Literature

THE MORPHOLOGY AND PHYSIOLOGY OF DISTOCLUSION

G. V. Fisk, M. R. Culbert, R. M. Grainger, B. Hemrend and R. Moyers. Am. J. Orthodont. 39:3 Jan. 1953.

Probably more has been written about Angle's Class II malocclusion than about anything else in orthodontics.

It is the purpose of this paper to scrutinize the research, evaluate and interpret the findings, summarize the known facts, explore the areas of disagreement and propose further studies to reveal factors at present unknown.

An investigation of this field leads into a maze of piecemeal experimentation. Some of the studies have been based on traditional precepts, others on the premise that man can reduce his cranial anatomy to geometry and mathematics. It is therefore not surprising that we emerge from the effort with an assortment of conclusions containing many contradictions.

William F. Ford

TREATMENT OF CHILD PATIENTS IN GENERAL PRACTICE

W. D. Suthers. J. D. A. South Africa 7:450 Dec. 15, 1952.

The importance of early and continued dental care of the school and preschool child is becoming universally recognized. Efforts should be devoted more and more toward preventive measures.

A dentist with the idea that children are an asset in any practice and that his treatment is worthy of a respectable fee will accomplish good dentistry for children, will overcome the problems of child management and will educate the parents to know that early examination and treatment of the child are required for good preventive dentistry.

Objectives in dentistry for children must include the preservation and retention of the deciduous teeth until their normal exfoliation time, the elimination of all foci of infection, the study of the growth and development pattern to prevent malocclusion and to correct any deviation from normal, the prevention of dental caries and the conditioning of the child to be a good dental patient. To fulfill these objectives one must create a good treatment program which will include an examination and prophylaxis, the restoration of carious teeth, pulp therapy, extractions, treatment of mouth infections, use of space maintainers, oral hygiene education and conditioning of the child to be a good dental patient.

The management of children depends on the attitude of the child, the attitude of the dentist and the attitude of the parent. The attitude of the child is influenced by the attitude of the dentist. A positive, firm, friendly, courteous manner on the part of the dentist in the approach to the patient will overcome most management problems with children. The dentist should acquaint the child with the instruments to be used, let him know that his obedience is required and proceed with the operation with a firm assured manner.

The parents must be educated to appreciate the necessity for treating the deciduous dentition and to acquire in general a more wholesome attitude toward dentistry for children. The parents should be asked to remain in the waiting room during the period of dental treatment for the child.

Premedication may be used to quiet high-strung, nervous children who remain apprehensive despite all efforts of the operator. Routine premedication is not recommended. When premedication is used, it is preferable to administer the drug in an unfermentable syrup.

Local anesthesia is recommended for routine operative procedures to remove one of the basic causes of fear—pain. The pain of injection can be reduced to a minimum by using a sharp needle, injecting slowly and having the solution warm. A topical anesthetic may be applied to the site of injection before the local anesthetic solution is deposited.

General anesthesia may be used for extractions and for operative work when a patient cannot or will not cooperate. There are, however, many disadvantages in doing operative work while the patient is under a general anesthetic.

Work accomplished during the first appointment should include an examination, prophylaxis and a bitewing roentgenographic survey. Children who are five years old or older should have a full mouth series of roentgenograms to reveal any abnormalities of the deciduous and permanent dentitions. The parents may be permitted to remain in the operatory during the first appointment if the child exhibits no behavior problem.

The second appointment is used to acquaint the parent with the complete diagnosis, the plan of treatment and the estimate of the cost of treatment. The operative work may be started and the child instructed in the use of the toothbrush.

A plan of treatment is made to have a definite idea of how much work must be accomplished and to approach the treatment more efficiently and intelligently.

Roy L. Lindahl

JOURNAL OF ORAL SURGERY
July 1952

THE USE OF ANTIBIOTICS
BY THE ORAL SURGEON

Stanley A. Lovestedt, p. 187.

Although several other factors influence the use of antibiotic agents, three circumstances are of special importance: (1) identification of the bacteria causing the infection; (2) a knowledge of sensitivity of the bacteria to the various antibiotics and (3) the employment of the proper antibiotic in sufficient dosage and for a proper length of time to prove effective.

The aim of antibiotic therapy is to establish an adequate concentration of the agent at the site of infection and to obtain maximal inhibition of bacterial growth or, if possible, death of the bacteria. Toxic reactions to antibiotics may be caused by the amount of the drug used, by the dosage or by sensitivity on the part of the host to the antibiotic used.

In order to use antibiotics effectively as therapeutic measures, a knowledge of the infectious process present is necessary. Satisfactory response to treatment occurs only when the treatment is directed specifically toward a known condition. Therefore, certain diagnostic facilities must be available.

The most important factor favoring the use of penicillin is the relative freedom from untoward reactions. Penicillin is not easily absorbed from the gastrointestinal tract, so that when the oral route is used it is necessary to provide in divided doses about five times the amount of antibiotic given intramuscularly. There is no standard therapeutic dosage of penicillin, for the reason that there is no standard set of circumstances which require the use of penicillin. Sensitivity reactions are said to occur in about 5 per cent of the patients who receive penicillin intramuscularly and 10 per cent of those who receive the agent by mouth. Continued administration of the drug after an allergic reaction develops constitutes a misuse of penicillin. One of the greatest misuses of penicillin is its administration for an infection caused by an organism which is not sensitive to penicillin or which is penicillin-resistant.

One great advantage of aureomycin is that it can be given by mouth. A maximal concentration of approximately 4 micrograms per cubic centimeter of blood serum follows multiple doses of aureomycin, and there appears to be no piling-up of the antibiotic in the blood serum. There is one situation, frequently encountered, in which aureomycin is of paramount importance, that is, in instances when the streptococci or staphylococci causing the disease are resistant to penicillin.

Terramycin is similar in its bacterial range to aureomycin, and in some instances the clinician has either agent at his command. One gram of terramycin by the oral route every six hours appears to maintain levels in the blood serum which should be therapeutically effective. Terramycin does not produce untoward reactions except some gastrointestinal irritation evidenced by nausea and occasionally by vomiting. The incidence of nausea and vomiting, however, is less frequent after ingestion of terramycin than of aureomycin. Terramycin can be given with milk, which does not interfere with its absorption. It is the oral surgeon's responsibility to use these drugs in the proper manner for conditions indicated, in amounts effective for a sufficient length of time to prevent the recurrence of infection when administration is discontinued and large enough to prevent the development of a resistant strain of organisms.

ROENTGENOLOGIC ASPECTS OF
ORAL SURGICAL PROBLEMS

Harrison M. Berry, Jr., p. 194.

A thorough and intelligent study of roentgenograms must be made in order that the operator may glean every bit of information from them.

When the apical portion of a root curves to the buccal or lingual side, the curvature can easily be overlooked in a hasty glance. If the curved portion of the root lies in a position parallel with the path of the roentgen rays, it produces an image on the film with the general appearance of a small radiopaque circle at or near the apex of the tooth, outlined by a radiolucent line (the periodontal membrane) and often with a radiolucent dot discernible at or near its center (the apical foramen).

Recognition of such a curvature to the buccal or lingual side is of prime importance in formulating a surgical plan of attack; this plan can be refined further by determining specifically whether the curvature is to the

lingual or to the buccal side. This determination can be accomplished by two methods, one of which might be called a "visual method" and the other a "geometric method." A third method that might prove of some value in the determination of a buccal or lingual curvature is the "right angle" technic, in which a second film is placed as nearly as possible at right angles to the first film.

A roentgenogram frequently reveals a horizontal inpaction of a mandibular third molar with its crown overlapping the second molar. In examining the roentgenogram, one should note the contact point between the first and second molars. If these teeth are in normal alignment in the mouth but are overlapping in the roentgenogram, the indication is that there is an incorrect horizontal angle which is responsible, at least in part, for the overlapping of the second and third molars. To determine whether the third molar lies to the buccal or lingual side of the second molar requires the application of one or more of the three methods described previously.

ORAL SURGERY IN ATOMIC WARFARE

Russell W. Bunting, p. 204.

Oral surgeons in civil defense planning will be assigned to base or already existing hospitals where in the event of a disaster they will be given full charge of those casualties with oral and facial involvements. In view of the importance of oral and maxillofacial surgeons in civil defense planning, it is highly important that all those who are qualified should be registered with the civil defense organization and be given specific assignments to the hospitals in which they will operate.

Since the number of such specially trained workers available is small, it is highly important that all of them be mobilized and alerted for immediate action in the event of a disaster either in their own community or in some distant site of an atomic attack.

TREATMENT OF OLD UNREDUCED FORWARD DISLOCATION OF THE TEMPOROMANDIBULAR JOINTS

J. A. Harpman, p. 205.

Nonreduction of anterior dislocation of the temporomandibular joints leads to dental malocclusion and to an appearance of mandibular prognathism. The temporomandibular joints of a boy, aged 16 years, had been dislocated forward 11 years previously and had not been replaced. The new joints that had developed allowed his mandible an almost normal range of movements, but mastication was imperfect because of gross dental malocclusion; his facial appearance was abnormal. The condition was corrected by a bilateral mandibular osteotomy between the inferior alveolar foramen and the coronoid notch.

The teeth were fixed by cast metal cap splints that had been cemented onto upper and lower bicuspid and molar teeth on each side some days previous to the osteotomy. About 20 months after the operation, information was received that the patient's mandibular deformity was recurring.

THIOPENTAL SODIUM: A COMPREHENSIVE REVIEW

Myron Kaufman, p. 211.

While it is freely acknowledged that there is no anesthetic agent or combination of anesthetic agents best suited for all oral surgical procedures, there is a definite place for thiopental sodium in oral surgery. Thiopental sodium is a hypnotic drug and not an anesthetic in the exact sense of the word. By producing a profound hypnosis, however, it causes a rapid loss of consciousness and a depression of reflexes similar clinically to that produced by an anesthetic agent.

The rate of detoxification varies with the method of administration, the rate being faster after a single initial intravenous injection and slower after injection of a similar amount by slow intravenous infusion. The contraindications to the use of thiopental sodium are: anemia; hypotension; noncompensated diabetes or acidosis from any cause; impaired respiratory function; operations in the pharynx, larynx or bronchi; cardiac disease with decompensation; diseases of the liver when hepatic dysfunction is sufficiently pronounced or of a type that might interfere with the detoxification process; operations of undetermined length; extremes of age; and operations requiring muscular relaxation.

The most common objection to the use of thiopental sodium in oral surgical procedures is that it encourages laryngospasm. In case of laryngospasm, oxygen under pressure should be administered immediately. Often forced oxygen alone is sufficient to break a spasm. An adequate open airway should be assured by the aspiration of secretions and foreign material from the oropharynx. If laryngospasm occurs in the early stages of anesthesia, the injection of small amounts of thiopental sodium usually deepens the anesthesia and may stop the spasm. If these measures fail to relieve the spasm, intratracheal intubation should be performed.

Premedication is limited in a majority of the cases to the use of atropine sulfate, 0.0006

Gm. (1/100 grain) administered intravenously at the time of induction. A 2.5 per cent solution of thiopental sodium in distilled water is advised for intravenous use.

For general anesthesia with thiopental sodium, Peterson recommends a sitting position in the dental chair. In this position the airway is maintained more easily and obstruction is less common. Furthermore, respiratory activity and capacity are greater when a patient is sitting up because of the freer function of the diaphragm and other musculature. It is to be noted that a combination of anesthetic agents is being used with increasing frequency. A type of anesthesia known as "balanced anesthesia" is induced by a combination, in which one agent supplies qualities that are missing in another. Nitrous oxide is frequently used as a supplement to thiopental sodium for all but short procedures.

Trichloroethylene seems to be gaining favor as a substitute for vinyl ether as a complemental agent. Trichloroethylene is less irritating, can be introduced more rapidly and produces quicker induction. Since thiopental sodium is usually administered rapidly and in strong concentration to produce rapid induction and surgical anesthesia, the earlier stages are telescoped so that the signs are either missed or are not well defined. The signs of anesthesia can be more easily differentiated, however, when the drug is given slowly in dilute solution. The ease of administration of thiopental sodium can often be considered a disadvantage, since it frequently prompts unskilled persons to attempt its use without considering the necessary adequate research and study relative to its administration. The safety of an anesthetic is in direct proportion to the skill of the anesthetist. In all cases it is particularly advisable to take a history of each patient.

CONTROL OF POSTOPERATIVE NAUSEA WITH THE USE OF DIMENHYDRINATE

Alvin L. Armer, p. 225.

It has been thought that postoperative nausea following general anesthesia is caused by disturbed equilibrium. Therefore, when dimenhydrinate (Dramamine) was released, it was felt that it might prevent this condition; and therefore tests were made of its postoperative effect.

The drug was administered both orally and parenterally. In those instances in which dimenhydrinate was administered orally, 100 mg. was given the patient at a time corresponding with the two meal hours preceding the operation. In those instances in which the dimenhydrinate was administered parenterally, 50 mg. was injected when the anesthetic was given.

The initial experiment indicated that the use of dimenhydrinate orally, parenterally or in the form of suppositories reduces the incidence of postoperative nausea.

MYOBLASTOMA OF THE BUCCAL MUCOSA

S. S. Fabe, p. 226.

Myoblastoma of the buccal mucosa is uncommon. The usual sites are the tongue, larynx and skin; but myoblastoma has been found also in the upper part of the esophagus and on the leg. It consists of polygonal cells with highly granular cytoplasm. In addition, there may be ribbonlike syncytial masses with granular cytoplasm. No cross striations are seen. A tumor of this type is essentially benign and is to be differentiated from rhabdomyoma, which is a benign tumor of striated muscle.

OSTEOPERIOSTEAL FLAP FOR OPERATION OF LARGE TUMORS AND CYSTS OF THE JAW

Sanford M. Moose, p. 229.

Any procedure that expedites the physiologic filling and regeneration of large bone cavities after an operation is desirable. Protection and immobilization of the blood clot are imperative to permit the early, orderly invasion of the clot by proliferating cells of young connective tissue. Regeneration following the introduction of foreign substances into bone cavities is not the result of utilization of these elements but rather the result of stimulation produced by the implanted material on the young connective tissue.

The autoplastic bone graft with its periosteal covering is the one most likely to be successful. Incision is made through the mucoperiosteum and the cortex of bone overlying the tumor or cyst. In many of these cases the cortical plate of bone is so thin that it can be incised with the scalpel simultaneously with the incision of the mucoperiosteum. After the incision of the entire osteomucoperiosteum is made, the inclusive flap is elevated and reflected to permit the exposure of the operative field.

After removal of the cyst or tumor, the osteomucoperiosteal flap is returned to its original position and sutured. This type of flap, with its bony lining adherent to the mucoperiosteum, adds stability and increases the osteogenetic surface of tissue surrounding the blood clot. The added rigidity imparted to such a flap by its adherent bone increases its clot-splinting property and usually obviates the necessity for additional splints.

ERYTHEMA NODOSUM OF DENTAL ORIGIN

Adrian L. Almquist, p. 231.

Erythema nodosum is a condition with specific lesions characterized by circumscribed indurated erythematous areas on the extensor surfaces of the legs and forearms. Almost any infectious disease may produce the condition. Outstanding causes are rheumatic fever, tuberculosis, syphilis and infections caused by the gonoccocus and meningococcus. Nonspecific streptococcic infections also may give rise to it.

Emphasis should be placed on discovering the causative factors and removing them. The condition may be caused by oral sepsis as shown in a reported case. In this case, three years after the teeth were removed, there had been no recurrence.

RENAL OSTEODYSTROPHY WITH ORAL MANIFESTATIONS

Irwin Lighterman, p. 233.

Renal osteodystrophy is a rare pathologic condition believed to be associated with chronic renal insufficiency caused in some cases by a congenital defect in the renal tubules. The syndrome of renal osteodystrophy results as the diseased kidney is unable to form ammonia, and a disturbed acid-base balance with lowered pH follows. This impaired renal function is followed by several abnormal physiologic reactions:

1. Hyperphosphatemia.
2. Increased renal excretion of calcium and hypocalcemia.
3. Hypertrophy of the parathyroid glands with increased parathormone secretion. This reaction tends to bring about a more normal serum calcium level and to decrease the serum phosphorus.
4. Mobilization of calcium from the skeletal system in response to the increased parathormone secretion.
5. With the withdrawal of calcium from the skeletal system, development of bone lesions which resemble those of hyperparathyroidism such as are seen in adults in osteitis fibrosa cystica and osteoporosis or rickets in children.

Roentgenographic evidence of renal osteodystrophy affecting the jaws is not seen in all instances. Histologically, the normal bone is replaced with the coarse fibrillar type of spongy bone.

ALVEOLECTOMY

Karl Hayden Wood, p. 239.

In a complete alveolectomy, especially when a large area of the anterior portion of the ridge is to be removed for esthetic reasons, there should be a consultation with the patient prior to the regular appointment for surgery.

Some of the reasons for performing an alveolectomy are as follows: to remove abnormally long and prominent ridges; to correct faulty occlusion; to correct anatomic abnormalities; to improve esthetics where anterior protrusion exists; to permit a better balanced denture by removing large tuberosities and undercuts; to eliminate protuberances, such as tori; to eliminate protruding areas in the mouth where teeth have been removed a few at a time over a long period; to eliminate sharp razor-edge ridges; to eliminate sharp mylohyoid ridges; and to trim bone when the alveolar process has been fractured at the time of a previous extraction.

The operation consists merely of reflecting the mucoperiosteum in the area where the surgery is to be performed; removing any abnormalities with rongeur forceps, chisels or burs; and smoothing with a file. The approximation of the labial and lingual periosteum follows, together with the necessary suturing.

The advances made by the oral surgeon in his specialty over the last decade together with the advent of the so-called wonder drugs used to combat infection and the wide choice in anesthetic agents are a few of the factors that have contributed to the successful outcome of alveolectomies.

MUSIC AS AN AID IN ORAL SURGERY

John W. Seybold, p. 246.

If reflex irritability is raised to high levels by fear, pain or temperature, it becomes more difficult to control the patient. The heightened reflex irritability produces an increased oxygen demand, particularly in the tissues of the central nervous system which can least withstand hypoxia or anoxia and are most subject to irreversible damage.

Music depresses reflex irritability, and consequently it is a decided safety factor since it aids in the elimination of the exciting stage of general anesthesia and its sequela. Music occupies the mind of a patient under deep conductive anesthesia and promotes mental comfort. The music should be soft, waltz time harmonies, pleasing and soothing to the patient.

Deaths

Babcock, Lester M., Milton, Wis.; Chicago College of Dental Surgery, Loyola University, 1904; died March 3; aged 79.

Barnard, Frank P., Monson, Mass.; Dental School, Harvard University, 1897; died February 8; aged 81.

Benz, Norman T., Syracuse, N. Y.; School of Dentistry, Temple University, 1904; died February 11.

Brown, Harold W., Lynn, Mass.; Dental School, Tufts College, 1914; died February 24; aged 65.

Bull, Milton M., Eugene, Ore.; College of Dentistry, Drake University, 1905; died March 1.

Burch, Harold K., Ann Arbor, Mich.; College of Dental Surgery, University of Michigan, 1917; died January 6; aged 61.

Butler, Edward C., Bloomington, Ill.; died December 29; aged 85.

Carter, Leland E., San Carlos, Calif.; College of Dentistry, University of California, 1907; died March 6; aged 70.

Chappuie, Gordon, Independence, Kan.; Dental School, Northwestern University, 1907; died March 3; aged 66.

Chase, Charles E. B., Framingham Center, Mass.; Dental School, Harvard University, 1892; died February 12; aged 83.

Chrisman, Edward W., Bloomington, Ill.; Dental School, Northwestern University, 1914; died February 20; aged 62.

Coleman, Guy T., Chicago; College of Dentistry, University of Illinois, 1906; died March 20; aged 77.

Clark, George W., Minneapolis; died March 20; aged 79.

Daly, Francis J., Cleveland; Faculty of Dentistry, University of Toronto, 1923; died February 21; aged 65.

Dickinson, Harold F. H., Columbus, Ohio; died January 2; aged 57.

Downey, Archibald W., Spokane, Wash.; Department of Dental Surgery, Wisconsin College of Physicians and Surgeons, 1909; died January 26; aged 67.

Doyle, Frank J., Brooklyn; College of Dental and Oral Surgery, New York, 1917; died March 6; aged 57.

Dunn, Joseph A., Piper City, Ill.; College of Dentistry, University of Illinois, 1907; died February 9; aged 72.

Du Rant, Edgar P., Sumter, S. C.; Atlanta Dental College, 1906; died February 13; aged 69.

Ebert, F. J., Mount Vernon, Wash.; School of Dentistry, University of Pennsylvania, 1904; died March 3.

Eggers, George, Cudahy, Wis.; Chicago College of Dental Surgery, Loyola University, 1896; died February 16; aged 79.

Ewald, Joseph S., Cleveland Heights, Ohio; Dental Department, Cleveland University of Medicine and Surgery, 1896; died January 31; aged 85.

Eyman, Alonzo C., Topeka, Kan.; Western Dental College, Kansas City, 1909; died December 15; aged 68.

Feldsher, Noah Z., Chicago; College of Dentistry, University of Illinois, 1908; died April 9.

Forwark, George O., Racine, Wis.; Dental School, Marquette University, 1926; died March 21; aged 56.

Frederick, William A., Ford City, Pa.; School of Dentistry, University of Pittsburgh, 1912; died January 29; aged 66.

Freeman, Melvin W., Brookline, Mass.; died February 9.

Fried, E. R., Seattle; College of Dentistry, University of Southern California, 1919; died February 24; aged 65.

Garcia, Harry E., San Francisco; College of Dentistry, University of California, 1930; died February 23; aged 49.

Gaynor, John S., Yuma, Ariz.; Chicago College of Dental Surgery, Loyola University, 1932; died December 30; aged 45.

Good, Roy F., Sanford, Maine; Dental School, Harvard University, 1916; died March 18; aged 64.

Gregory, Thomas G., Jr., Akron, Ohio; School of Dentistry, Western Reserve University, 1950; died February 6; aged 30.

Gress, Guy, Chambersburg, Pa.; Baltimore College of Dental Surgery, 1891; died February 7; aged 80.

Griffin, Wilber C., Winfield, Iowa; College of Dentistry, University of Illinois; 1911; died January 6.

Grigg, Thompson C., Shelby, N. C., Southern Dental College, Atlanta, 1911; died March 17; aged 68.

Gruber, Max F., Canton, Ohio; Dental School, Northwestern University, 1913; died December 17; aged 61.

Hall, Nathan G., Providence, R. I.; Baltimore College of Dental Surgery, University of Maryland, 1905; died January 19; aged 75.

Hall, William B., Danville, Ill.; Dental School, Northwestern University, 1896; died January 7; aged 81.

Hanahan, William J., Santa Cruz, Calif.; College of Physicians and Surgeons, San Francisco, 1921; died January 6; aged 67.

Hara, George, San Diego; College of Dentistry, University of California, 1940; died December 26; aged 37.

Harris, Joseph G., Cuba City, Wis.; Dental School, Northwestern University, 1908; died January 22; aged 71.

Hilton, David L., North Little Rock, Ark.; Kansas City-Western Dental College, 1922; died February 7; aged 56.

Hindenach, Leo A., Independence, Kan.; School of Dentistry, St. Louis University, 1919; died December 29; aged 60.

Hitchcock, Norris A., Fremont, Neb.; died December 10.

Hoermann, Alfred H., Watertown, Wis.; Chicago College of Dental Surgery, Loyola University, 1903; died October 23; aged 78.

Holt, Clarence E., Portland, Maine; School of Dentistry, Temple University, 1896; died January 4.

Hostetter, Walter J., Littleton, Colo.; Omaha Dental College, 1898; died January 8; aged 81.

Howes, Minnie I., Indianapolis; School of Dentistry, Indiana University, 1895; died January 9.

Huber, Dawson H., Philadelphia; School of Dentistry, University of Pennsylvania, 1906; died January 23; aged 70.

Hunter, Donald S., Baltimore; Baltimore College of Dental Surgery, University of Maryland, 1936; died January 5; aged 38.

Igel, Herman, New York; Baltimore College of Dental Surgery, University of Maryland, 1899; died January 9; aged 82.

Igel, Victor, Brooklyn; died February 8; aged 82.

Ingram, John H., Farrell, Pa.; College of Dentistry, Howard University, 1923; died January 8.

Irwin, James N., Brighton, Iowa; College of Dentistry, University of Iowa, 1904; died January 19; aged 75.

Jackman, Robert W., Bradford, Pa.; Baltimore College of Dental Surgery, 1908; died October 1.

Johnston, Leo S., Louisville, Ky.; School of Dentistry, University of Louisville, 1900; died January 3; aged 52.

Jones, Louis F., Boston; died in January; aged 73.

Kershaw, Abraham M., Columbus, Ohio; Department of Dentistry, Starling-Ohio Medical College, 1908; died January 9; aged 73.

Khuri, Ibrahim M., Detroit; Chicago College of Dental Surgery, Loyola University, 1916; died October 23.

Killeen, Frank M., Scranton, Pa.; School of Dentistry, Temple University, 1918; died January 8.

Kneedler, William A., Denver; School of Dentistry, St. Louis University, 1925; died December 23; aged 54.

Lang, John F., Woodville, Ohio; Baltimore College of Dental Surgery, 1909; died September 20.

Lee, Mathilde S., New York; died January 22; aged 81.

Leisen, Vincent J., Saint Cloud, Minn.; College of Dentistry, University of Minnesota, 1923; died December 2; aged 51.

Leonard, Thomas M., Indianapolis; School of Dentistry, Indiana University, 1925; died November 29; aged 51.

Little, Leo T., Cresson, Pa.; School of Dentistry, University of Pittsburgh, 1919; died September 16.

Lyon, Warren F., Des Moines, Iowa; College of Dentistry, University of Iowa, 1952; died January 28; aged 27.

MacNeill, William, Silverton, Ore.; School of Dentistry, North Pacific College of Oregon, 1916; died in December; aged 63.

Manry, Chaudoin, Atlanta, Ga.; Atlanta Dental College, 1903; died December 17.

Marvin, George P., Rochester, N. Y.; School of Dentistry, University of Pennsylvania, 1902; died January 19; aged 71.

McCullough, Joseph C., Du Bois, Pa.; Medico-Chirurgical College of Philadelphia, 1916; died January 25; aged 57.

McDonald, Guy M., Columbus, Ohio; College of Dentistry, Ohio Medical University, Columbus, 1901; died January 30; aged 76.

McFerrin, Marvin, Nashville, Tenn.; School of Dentistry, Vanderbilt University, 1888; died January 1; aged 85.

McGee, George A., Highland Park, Mich.; School of Dentistry, University of Detroit, 1937; died January 22; aged 48.

Merla, Charles P., Long Branch, N. J.; School of Dentistry, University of Pennsylvania, 1914; died February 1; aged 61.

Miller, Paul H., Ulrichsville, Ohio; Dental Department, George Washington University, 1903; died January 31; aged 74.

Mongeau, Harry J., Brockton, Mass.; Dental School, Tufts College, 1921; died January 4; aged 54.

Moon, George R., East Orange, N. J.; Philadelphia Dental College, 1905; died January 6; aged 83.

Moran, Michael J., Deming, N. M.; Indiana Dental College, 1903; died January 26; aged 75.

Mork, Waldo H., New York; New York College of Dentistry, 1903; died February 11; aged 71.

Nahar, Harry S., West Newton, Pa.; Pennsylvania College of Dental Surgery, Philadelphia, 1903; died November 30.

Noecker, Joseph L., St. Louis; School of Dentistry, St. Louis University, 1917; died January 6; aged 70.

O'Boyle, Leo J., Dunmore, Pa.; School of Dentistry, University of Pennsylvania, 1919; died December 28; aged 57.

Oviatt, Ernest C., Columbus, Wis.; Dental Department, Milwaukee Medical College, 1900; died January 21; aged 83.

Peterson, DeLyle W., Lakewood, Ohio; College of Dental Surgery, University of Michigan, 1905; died January 19; aged 71.

Porter, Howard K., Dayton, Ohio; College of Dentistry, Ohio State University, 1921; died January 7; aged 54.

Powell, Raymond H., Joliet, Ill.; Dental School, Northwestern University, 1924; died December 26; aged 56.

Proskey, Theodore H., Duquesne, Pa.; School of Dentistry, University of Pittsburgh, 1924; died February 1; aged 51.

Quinby, Edward M., Brookline, Mass.; Dental School, Harvard University, 1893; died January 16.

Redlich, Hermann E., Chicago; Chicago College of Dental Surgery, Loyola University, 1922; died September 29.

Richardson, Lester D., Auburn, Ind.; Indiana Dental College, 1924; died January 31; aged 53.

Robertson, Arthur H., Janesville, Wis.; Dental School, Northwestern University, 1903; died October 12; aged 76.

Rood, Henry A., Cleveland; School of Dentistry, Western Reserve University, 1919; died January 4.

Rose, Edgar D., Bowling Green, Ky.; School of Dentistry, Vanderbilt University, 1896; died December 1; aged 78.

Ross, Charles F., Lebanon, N. H.; Dental School, Harvard University, 1911; died in February; aged 63.

Ross, James W., Milbank, S. D.; died December 16.

Rothenberg, Louis H., Stamford, Conn.; Baltimore College of Dental Surgery, University of Maryland, 1906; died October 10; aged 68.

Rowand, William H., Cleveland; School of Dentistry, Indiana University, 1886; died December 26.

Rowland, Cornelius T., San Antonio, Texas; School of Dentistry, University of Denver, 1926; died December 30.

Sather, William, Oklahoma City; Western Dental College, Kansas City, 1913; died January 12; aged 64.

Sebora, Earl L., Athens, Wis.; Dental School, Marquette University, 1919; died in January; aged 56.

Shalit, Harold M., Portland, Maine; School of Dentistry, Temple University, 1914; died January 4.

Shneyer, Abraham, Kearny, N. J.; Medico-Chirurgical College of Philadelphia, 1914; died January 25.

Smith, Edward H., Libertyville, Ill.; Dental School, Northwestern University, 1894; died February 2; aged 85.

Smith, Harry S., McKeesport, Pa.; Pittsburgh Dental College, Western University of Pennsylvania, 1905; died January 25; aged 75.

Smithe, John W., Chicago; Chicago College of Dental Surgery, Loyola University, 1936; died January 28; aged 40.

Spoeneman, Carl A., St. Louis; School of Dentistry, St. Louis University, 1912; died January 16; aged 67.

Taggart, Deane P., Greenfield, Mass.; School of Dentistry, University of Pennsylvania, 1905; died December 24; aged 70.

Thomas, Herman G., Blythe, Calif.; died in January.

Thorpe, Raymond A., Darien, Wis.; Chicago College of Dental Surgery, Loyola University, 1918; died in January; aged 54.

Van Roy, Peter A., Green Bay, Wis.; Dental School, Marquette University, 1918; died December 27; aged 65.

Vaughn, Russell U., Los Angeles; Colorado College of Dental Surgery, 1906; died December 31; aged 69.

Wadlington, Robert L., Memphis, Tenn.; School of Dentistry, Tulane University, 1911; died January 8; aged 79.

Waldo, Charles M., Boston; College of Dental Surgery, University of Michigan, 1930; died January 29; aged 46.

Weaver, Elbert J., Milwaukee; School of Dentistry, University of Pennsylvania, 1896; died January 30; aged 80.

Wedge, Charles A., Canton, Ill.; Chicago College of Dental Surgery, Loyola University, 1892; died December 31; aged 83.

Williams, George A., Oakland, Calif.; College of Physicians and Surgeons, San Francisco, 1924; died October 21.

Wing, William, Alameda, Calif.; College of Dentistry, Ohio Medical University, Columbus, 1901; died January 16; aged 76.

Wooley, Leland S., Pocatello, Idaho; Dental School, Northwestern University, 1924; died January 17; aged 54.

Directory

OFFICERS

Otto W. Brandhorst, President.....4952 Maryland Ave., St. Louis
Leslie M. FitzGerald, President-Elect.....718 Roshek Bldg., Dubuque, Iowa
Henry F. Westhoff, First Vice-President.....Missouri Bldg., St. Louis
F. A. Pierson, Second Vice-President.....1112 Federal Securities Bldg., Lincoln, Neb.
John A. O'Keefe, Third Vice-President.....1801 K St., N.W., Washington, D. C.
Harry Lyons, Speaker, House of Delegates...School of Dentistry, Medical College of Virginia, Richmond, Va.
Harold Hillenbrand, Secretary.....222 E. Superior St., Chicago
C. Willard Camalier, Assistant Secretary.....1726 Eye St., N.W., Washington, D. C.
Louis M. Cruttenden, Assistant Secretary.....222 E. Superior St., Chicago
H. B. Washburn, Treasurer.....Lowry Medical Arts Bldg., St. Paul
Lon W. Morrey, Editor.....222 E. Superior St., Chicago

BOARD OF TRUSTEES

Earl G. Jones, 1955, Seventh District.....185 E. State St., Columbus, Ohio
A. F. Schopper, 1955, Sixth District.....914 Professional Bldg., Kansas City, Mo.
Charles I. Taggart, 1955, First District.....139 Bank St., Burlington, Vt.
Lewis W. Thom, 1955, Tenth District.....1546 Medical Arts Bldg., Minneapolis
William R. Alstadt, 1954, Twelfth District.....610 Boyle Bldg., Little Rock, Ark.
Bernerd C. Kingsbury, 1954, Thirteenth District.....490 Post St., San Francisco
Percy T. Phillips, 1954, Second District.....18 E. 48th St., New York
Clarence S. Renouard, 1954, Eleventh District.....304 Phoenix Bldg., Butte, Mont.
W. Earle Craig, 1953, Third District.....8113 Jenkins Arcade, Pittsburgh
L. H. Jacob, 1953, Eighth District.....Jefferson Bldg., Peoria, Ill.
James E. John, 1953, Fifth District.....Medical Arts Bldg., Roanoke, Va.
Daniel F. Lynch, 1953, Fourth District.....1678 Primrose Road, N.W., Washington, D. C.
Obed H. Moen, 1953, Ninth District.....Watertown, Wis.

BUREAUS

Economic Research and Statistics: B. D. Moen, Director, 222 E. Superior St., Chicago
Library and Indexing Service: Donald A. Washburn, Director, 222 E. Superior St., Chicago
Public Information: Herbert B. Bain, Director, 222 E. Superior St., Chicago

COUNCILS

Constitution and Bylaws: Max E. Ernst, Chm., Lowry Medical Arts Bldg., St. Paul
Dental Education: B. L. Hooper, Chm., 1004 Sharp Bldg., Lincoln, Neb.
Shailer Peterson, Secy., 222 E. Superior St., Chicago
Dental Health: David W. Brock, Chm., 6026 Enright Ave., St. Louis 12
Dental Museum and Registry: Henry A. Swanson, Chm., 1726 Eye St., N.W., Washington, D. C.
Dental Research: M. K. Hine, Chm., 1121 W. Michigan St., Indianapolis

Dental Therapeutics: Thomas J. Hill, Chm., 2085 Adelbert Road, Cleveland
J. Roy Doty, Secy., 222 E. Superior St., Chicago

Dental Trade and Laboratory Relations: F. W. Herbine, Chm., 230 N. Fifth St., Reading, Pa.
Bernard J. Conway, Secy., 222 E. Superior St., Chicago

Federal Dental Services: R. H. Friedrich, Chm., 960 Park Ave., Plainfield, N. J.
Bernard J. Conway, Secy., 222 E. Superior St., Chicago

Hospital Dental Service: Frank B. Hower, Chm., 814 Heyburn Bldg., Louisville, Ky.
Gerard J. Casey, Secy., 222 E. Superior St., Chicago

Insurance: Paul W. Zillmann, Chm., 29 Walden Ave., Buffalo

International Relations: O. A. Oliver, Chm., 1915 Broadway, Nashville, Tenn.

Journalism: W. L. Barnum, Chm., Morgan Bldg., Portland, Ore.

Judicial Council: H. B. McCarthy, Chm., College of Dentistry, Baylor University, Dallas, Texas

Legislation: E. Harold Gale, Chm., 142 Washington Ave., Albany, N. Y.
Francis J. Garvey, Secy., 222 E. Superior St., Chicago

Membership: J. R. Wallace, Chm., 31 Church St., Winchester, Mass.

National Board of Dental Examiners: G. L. Teall, Chm., P. O. Box 71, Hiawatha, Kan.
Gerard J. Casey, Secy., 222 E. Superior St., Chicago

Relief: Leo W. Kremer, Chm., 1725 S. E. 13th St., Fort Lauderdale, Fla.
M. C. Hansen, Secy., 420 Seventh St., Racine, Wis.

Scientific Session: William A. Garrett, Chm., Candler Bldg., Atlanta, Ga.

SECTION CHAIRMEN

Operative Dentistry: Miles R. Markley, 632 Republic Bldg., Denver

Oral Surgery and Anesthesia: Irwin T. Hyatt, 56 Fifth St., N.E., Atlanta, Ga.

Orthodontics and Oral Development: Robert M. Ricketts, 15247 Sunset Blvd., Pacific Palisades, Calif.

Pedodontics: Harold K. Addelston, 424 Madison Ave., New York

Periodontics: B. O. A. Thomas, School of Dentistry, University of Washington, Seattle

Practice Management: Ralph H. Campbell, 4741 Spokane Ave., Detroit

Prosthodontics, Complete: Frank M. Kyes, U. S. Naval Amphibious Base, Little Creek, Norfolk, Va.

Prosthodontics, Partial: Chester M. Perry, 16350 E. Warren Ave., Detroit

Public Health Dentistry: Milton E. Nicholson, 609 Shields Bldg., Pittsburgh

Research: H. B. G. Robinson, School of Dentistry, Ohio State University, Columbus, Ohio

Roentgenology: H. Cline Fixott, Jr., 308 Selling Bldg., Portland, Ore.

THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
WHitehall 4-6730

LON W. MORREY, *Editor* JOHN J. HOLLISTER, *Business Manager*

All expressions of opinion and all statements of supposed fact are published on the authority of the writer over whose signature they appear and are not to be regarded as expressing the views of the American Dental Association, unless such statements or opinions have been adopted by the Association. *Articles* are accepted with the understanding that they have not been published previously and that they are submitted solely to THE JOURNAL. *Advertising copy* must conform to the official standards established by the American Dental Association. *Notice of change of address* should be received one month before the change is to be effective. *Orders for reprints of* JOURNAL articles must be received by the Business Manager's office not later than the 15th of the month of issue in order to secure advantage of the lowest possible prices. Orders received after this date are subject to special quotation.

Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Fourth Annual Session	Sept. 28-Oct. 1, 1953	Cleveland
Ninety-Fifth Annual Session	Nov. 8-11, 1954	Miami
Ninety-Sixth Annual Session	Oct. 17-20, 1955	San Francisco

MEETINGS OF STATE SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 26, 27, 1954	Biloxi, Miss.	F.A. Finney, Jr.	1045 Forrest Ave., Gadsden
Alaska	July 12-16	Juneau	J. D. Smith	Box 134, Juneau
Arizona			E. M. Scott	17 E. Weldon Ave., Phoenix
Arkansas	Apr. 1954	Little Rock	D. M. Hamm	Box 89, Clarksville
California	Apr. 26-28, 1954	San Francisco	L. R. Ludwigsen	450 Sutter St., San Francisco
S. California	May 3-5, 1954	Los Angeles	J. P. Bowers	903 Crenshaw Blvd., Los Angeles
Colorado	Oct. 4-7	Colorado Springs	W. R. Humphrey	724 Republic Bldg., Denver
Connecticut			E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan. 14, 1954	Wilmington	J. C. Baker	Mayfair Apts. Sec. C, 1300 Harrison St., Wilmington
District of Columbia	Mar. 14-17, 1954	Washington	K. H. Wood	202-1835 Eye St., N.W., Washington
Florida		Daytona Beach	B. S. Carroll	706 Professional Bldg., Jacksonville
Georgia	Oct. 18-21	Atlanta	J. W. Yarbrough	Bibb Bldg., Macon
Hawaii	June 24-27	Honolulu	J. H. Dawe	810 N. Vineyard St., Honolulu 17
Idaho	June 28-July 2	Sun Valley	J. F. Julian	206 Rogers Bldg., Idaho Falls
Illinois			P. W. Clopper	623 Jefferson Bldg., Peoria 2
Indiana			E. E. Ewbank	Kingman
Iowa			H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas			F. A. Richmond	861 Brotherhood Bldg., Kansas City
Kentucky	Apr. 5-7, 1954	Louisville	A. B. Coxwell	1976 Douglass Blvd., Louisville
Louisiana			J. S. Bernhard	2515 Line Ave., Shreveport
Maine	June 25-27	Rockland	S. M. Gower	Box 27, Skowhegan
Maryland			E. L. Pessagno, Jr.	19 Medical Arts Bldg., Baltimore 1
Massachusetts			H. E. Tingley	12 Bay State Road, Boston
Michigan	Apr. 25-28, 1954	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Feb. 22-24, 1954	St. Paul	C. V. E. Cassel	242 Lowry Medical Arts Bldg., St. Paul
Mississippi			H. M. Campbell	102 Professional Bldg., Tupelo
Missouri			E. D. Suggett	201 Merchants Bank Bldg., Jefferson City
Montana			C. S. Renouard	304 Phoenix Bldg., Butte
Nebraska			F. A. Pierson	1112 Federal Securities Bldg., Lincoln
Nevada			J. E. Ahlstrom	1150 Arizona, Boulder City
New Hampshire	June 11-14	Bretton Woods	F. E. Williams	814 Elm St., Manchester
New Jersey	May 4-6, 1954	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico			J. S. Eilar	Suite 7, Medical Arts Square, Albuquerque
New York			C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina			B. N. Walker	608 Liberty Life Bldg., Charlotte
North Dakota			V. B. Keltgen	517 de Lendrecie Bldg., Fargo
Ohio	Nov. 8-11	Columbus	E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 25-28, 1954	Oklahoma City	D. Robertson	434 N.W. 13th St., Oklahoma City
Oregon	Mar. 1-3, 1954	Portland	W. F. Gulick	316 S.E. 80th St., Portland
Panama Canal Zone	Dec. 8	Balboa	C. F. Atkins	U. S. Army Hospital, Fort Clayton
Pennsylvania			M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico			F. Ordoñez	1558 Ponce de León Ave., Stop 23, Santurce
Rhode Island	Jan. 17, 19, 20, 1954	Providence	N. G. Migliaccio	1467 Westminster St., Providence

State	Date	Place	Secretary	Address
South Carolina	June 18-24	Caribbean Cruise	J. R. Owings	7 Medical Court, Greenville
South Dakota			E. W. Elmen	Sioux Falls
Tennessee			W. L. McCulley	Brown Bldg., Cleveland
Texas			W. Ogle	3607 Gaston Ave., Dallas
Utah			K. L. Dedekind	914 Medical Arts Bldg., Salt Lake City
Vermont			W. J. Reardon	Rutland
Virginia			J. E. John	804 Medical Arts Bldg., Roanoke
Washington	June 18-20	Yakima	F. J. Dingler	1502 Medical-Dental Bldg., Seattle
West Virginia	July 19-22	White Sulphur Springs	A. B. Drake	506 West Virginia Bldg. Huntington 1
Wisconsin	Apr. 19-21, 1954	Milwaukee	R. A. Mason	964 N. 27th St., Milwaukee
Wyoming	June 21-24	Laramie	T. J. Drew	State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Alabama	June 15*	Birmingham	N. E. Allen	Du Bose Bldg., Selma
Alaska	July 6-10	Fairbanks	J. H. Geyer	209 Goldstein Bldg., Juneau
Arizona	Aug. 10-15	Florence	R. K. Trueblood	107 East A Ave., Glendale
Arkansas	June 22-26	Little Rock	H. O. Weatherly	205 Halter Bldg., Conway
California	July 27	San Francisco	K. I. Nesbitt	507 Polk St., San Francisco 2
	June 22	Los Angeles		
Colorado	June 22-26	Denver	C. K. Phillips	724 Republic Bldg., Denver 2
Connecticut	June 15-20	Bridgeport	C. G. Brooks	302 State St., New London
Delaware	June 29-July 1	Wilmington	P. K. Musselman	143 W. Main St., Newark
District of Columbia	June 1-5	Washington	W. T. Birthright	1835 Eye St., N. W., Washington 6
Florida	July 6-14*	Jacksonville	A. W. Kellner	P. O. Box 155, Hollywood
Georgia	June 8	Atlanta	S. H. Yarbrough	12 Medical Arts Bldg., Columbus
Hawaii	Aug. 31, Sept. 1, 5, 6*	Honolulu	H. L. Houvener	427 Dillingham Bldg., Honolulu
Idaho	June 24-26	Boise	R. E. Blinkenstaff	1023 Fourth St., S., Nampa
Illinois	June 23-26	Chicago	W. A. McKee	503 Wood Bldg., Benton
Indiana	June 16-19*	Indianapolis	C. A. Frech	504 Broadway, Gary
Iowa			H. M. Willits	719 Roshek Bldg., Dubuque
Kansas	June 1-4	Kansas City, Mo.	G. L. Teall	Box 71, Hiawatha
Kentucky	June 8-11	Louisville	R. I. Todd	Western Union Bldg., Richmond
Louisiana	June 1-5	New Orleans	R. C. Steib	833 Maison Blanche Bldg., New Orleans
Maine	June 22-25	Boston	R. A. Derbyshire	Box 387, Skowhegan
Maryland	June 8-10	Baltimore	H. Levin	3429 Park Heights Ave., Baltimore 15
Massachusetts	June 15-19†	Boston	R. A. Barrette	Rm. 33 State House, Boston
	June 17-19‡‡			
Michigan	June 7-13	Ann Arbor	J. L. Champagne	3714 W. McNichols Road, Detroit 21
Minnesota	June 15-19	Minneapolis	F. A. Larson	1632 Washington St., N.E., Minneapolis
Mississippi	June 16-18	Jackson	J. C. Boswell	508 Lamar Life Bldg., Jackson
Missouri	June 8, 9, 12, 13	St. Louis	R. R. Rhoades	414 Central Trust Bldg., Jefferson City
	June 10-13	Kansas City		
Montana	July 13-16	Helena	V. J. Quinn	301 Phoenix Bldg., Butte
Nebraska	June 8-13	Lincoln	H. E. Weber	1210 Federal Securities Bldg., Lincoln
Nevada	June 1	Reno	G. C. Steinmiller	Suite 6, Masonic Temple, P. O. Box 2473, Reno
New Hampshire	June 19, 20	Boston	D. J. Freese	4 Wall St., Concord
New Jersey	June 29, 30**††	Philadelphia	W. A. Wilson	150 E. State St., Trenton 8
	June 17, 18**	New York		
	July 1-3§	Trenton		
New Mexico	June 22-25	Santa Fe	J. J. Clarke, Sr.	Artesia
New York	June 23-26§	New York	D. W. Beier	23 S. Pearl St., Albany 7
		Buffalo		
		Albany		
		Rochester		
		Syracuse		
	June 18, 19**	New York		
		Buffalo		
North Carolina	June 22-26	Chapel Hill	F. O. Alford	1109 Liberty Life Bldg., Charlotte 2
North Dakota	July 13-17	Fargo	A. B. Crabtree	Ellendale
Ohio	June 18-20§‡	Columbus	H. B. Smith	336 E. State St., Columbus
	June 22-24**			
	June 20††			

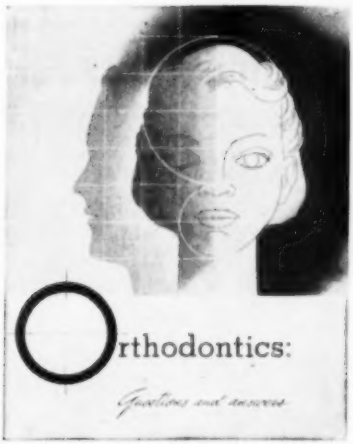
State	Date	Place	Secretary	Address
Oklahoma	June 21-24	Oklahoma City	R. P. Keidel	403 Surety Bldg., Muskogee
Oregon	June 15-18*	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
Pennsylvania	June 22-24§‡	Philadelphia and Pittsburgh	A. M. Stinson	Dept. of Public Instruction, Box 911, Harrisburg
	June 25-27**	Philadelphia		
	June 25††	Philadelphia		
Puerto Rico	Sept.§§	San Juan	L. C. Coll	Box 9156, Santurce
Rhode Island	June 15-17	Providence	F. M. Hackett	267 Academy Ave., Providence
South Carolina	July 1-3	Columbia	T. C. Sparks	1315 Pickens St., Columbia
South Dakota	June 21-24	Sioux Falls	H. T. Aker	Canton
Tennessee	June 15-19	Memphis	F. S. Maxey	804 Bennie Dillon Bldg., Nashville 3
Texas	June 14-20†	Dallas	R. T. Weber	412 Capital National Bank Bldg., Austin
	June 19, 20‡‡			
Utah	June 26-July 3	Salt Lake City	E. O. Thompson	915 Medical Arts Bldg., Salt Lake City
Vermont	June 22-24	Burlington	F. A. Reid	Windsor
Virginia	June 8, 9‡‡	Richmond	J. M. Hughes	715 Medical Arts Bldg., Richmond 19
	June 8-13†			
Washington	June 22-26*	Seattle	T. D. Schimke	662 Paulsen Medical and Dental Bldg., Spokane
West Virginia	June 22-24*	West Liberty	C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin	June 15-19*	Milwaukee	S. F. Donovan	Tomah
Wyoming	June 16	Casper	W. A. Hocker	212 O & S Bldg., Casper

*Dentistry and dental hygiene.
**Dental clinical examinations.
†Dental examinations.
††Hygiene clinical examinations.
§Dental written examinations.
‡‡Hygienists' examinations.
‡Hygiene written examinations.
§§Indicates approximate dates. These dates should be verified with the State Examining Board.

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
American Academy of Dental Medicine	June 26-28	Washington, D. C.	W. M. Greenhut Secy.	124 E. 84th St., New York
American Academy of Implant Dentures	Sept. 27	Cleveland	P. S. Loechler Secy.	Dental Corps, Camp Gordon, Ga.
American Academy of Pedodontics	June 24-26	Louisville, Ky.	R. M. Erwin, Jr. Secy.	911 Selling Bldg., Portland, Ore.
American Association of Dental Examiners	Sept. 25, 26	Cleveland	C. A. Bumstead Secy.	924 Stuart Bldg., Lincoln, Neb.
American Board of Dental Public Health	Sept. 24, 25	Cleveland	P. E. Blackerby, Jr. Secy.	250 Champion St., Battle Creek, Mich.
American College of Dentists	Sept. 27	Cleveland	O. W. Brandhorst Secy.	4952 Maryland Ave., St. Louis
American Dental Assistants Association	Sept. 28-Oct. 1	Cleveland	M. L. Martin Exec. Secy.	410 First National Bank Bldg., LaPorte, Ind.
American Dental Society of Europe	Aug. 4-7	Bergen, Norway	F. D. Derrick Hon. Secy.	140, Park Lane, London W. 1, England
American Denture Society	Sept. 25, 26	Cleveland	A. L. Roberts Secy.	Aurora National Bank Bldg., Aurora, Ill.
American Society of Dentistry for Children	Sept. 25-27	Cleveland	C. F. Tuma Chm. Local Arrangements	13201 Miles Ave., Cleveland
Arpa Internationale, Thirteenth Congress	July 13-19	Geneva, Switzerland	J. N. Nally Secy. Gen., Com. on Organization	8, rue de Saussure, Geneva, Switzerland
Berkshire Conference in Periodontology and Oral Pathology	June 14-18	Boston	I. Glickman Dir.	Tufts College Dental School, 136 Harrison Ave., Boston 11
Canadian Dental Association	Oct. 18-21	Montreal, Canada	D. W. Gullett Secy.	234 St. George St., Toronto, Ontario, Canada
Federation Dentaire Internationale	July 26-Aug. 1	Oslo, Norway	G. H. Leatherman Hon. Secy.	35 Devonshire Place, London W. 1, England
Great Lakes Society of Orthodontists	Nov. 2-4	Grand Rapids, Mich.	C. R. Anderson Secy.	402 Loraine Bldg., Grand Rapids, Mich.
Greater New York Dental Meeting	Dec. 7-11	New York	M. Purdy Exec. Secy.	Hotel Statler, Room 106A, New York
National Board of Dental Examiners	Dec. 7, 8		G. J. Casey Secy.	222 E. Superior St., Chicago 11
New England Dental Society	Oct. 21, 22	Boston	F. L. Finley, Jr. Secy.	43 Farmington Ave., Hartford, Conn.
Southern Society of Orthodontists	Nov. 1-4	Orlando, Fla.	M. D. Edwards Secy.	132 Adams Ave., Montgomery, Ala.

ORTHODONTICS



A pamphlet produced by the Council on Dental Health after consultation with recognized authorities in the field of orthodontics. Sample copy on request.

ORTHODONTICS answers many of the questions commonly asked by parents about the child who needs orthodontic care. It presents information on:

Healthy and attractive teeth as an asset—Prevalence of malocclusion—Causes of malocclusion—Prevention or correction of malocclusion—Factors governing treatment.

use this order blank

Order Department, AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois

Check the order you wish to place for P-11, ORTHODONTICS booklets:

☐ *25 Copies.....$1.60*
☐ *50 Copies.....$2.60*
☐ *100 Copies.....$4.45*

Please send remittance with order

name _____

address _____

city _____ *zone* _____ *state* _____

please type or print

Uniform film density...
Fine radiographic detail...
Consistent results...

YES, CDX GIVES YOU ALL 3!

From the day the first CDX was introduced more than 30 years ago, it has consistently set the pace for better dental x-ray. Continuous General Electric research and engineering have maintained this position of leadership.

Today's CDX is a compact, flexible unit you can depend on to meet every conceivable requirement. Oil immersion of the high-voltage transformer and x-ray tube provides the most efficient shock-proofing-cooling method. In addition, small-size head and unusual maneuverability give you the ultimate in flexibility.

Ask your dealer to demonstrate CDX for you today. Or write X-Ray Department, General Electric Company, Milwaukee 1, Wisconsin, for Pub. JJ-6.

You can put your confidence in —

GENERAL ELECTRIC

it costs no more to be sure

it will fit . . . just make it

a *Replicast* PRECISION REMOVABLE

Think what it would be worth to your peace of mind to know in advance that your partial cases—no matter how difficult—will fit just as you intended they should.

But whatever that comforting assurance would be worth to you, you don't have to *pay* more for it. It's a part of the bonus you get—in satisfaction and in enhanced prestige—when you order REPLICAST precision removables.

The reason lies in the testing-laboratory precision of the Dresch-developed REPLICAST technic, which eliminates the "variables" of conventional casting methods. Like the precision technics of industry, it lends itself to efficient, step-by-step production, yielding a more accurate result at a cost that is no greater, and in some cases even less.

Discover for yourself why these supremely accurate appliances have won preferment by outstanding dentists from coast to coast. Mail the coupon or write for full particulars now.

REPLICAST ...A METHOD... NOT A MATERIAL

The Dresch Laboratories Company
1009 Jackson Street—Toledo 1, Ohio

Tell me more about 'REPLICAST' precision removables.

DR._____

*Street Address*_____

*City—Zone—State*_____

He Fought Three Days and Nights

Lieutenant Colonel
Raymond G. Davis, USMC
Medal of Honor

COLD, BATTLE-WEARY, the Marines were re-deploying toward Hungnam. A rifle company was guarding a mountain pass vital to the withdrawal of two regiments. The company became surrounded. If help didn't come, 6,000 men were lost.

Into this situation, Lieutenant Colonel Davis boldly led his Marine battalion. Over eight miles of heavily defended icy trail they attacked, and across three ridges deep in snow.

They fought three days and nights.

But finally Colonel Davis reached and freed the company. He opened the pass and held it till the two regiments got by. Then, fighting through the last of the enemy and carrying his wounded with him, he led his own gallant battalion into safety.

"Korea and World War II have taught me," says Colonel Davis, "that courage is common to *all* armies; it's the *better equipped* side that has the edge. You're giving *our* men that edge every time you invest in a Defense Bond. For Bonds, which are personal savings for you, are also muscle for America's economy. Helping produce *better* equipment to protect the brave men who are protecting us all."

Peace is for the strong! For peace *and prosperity* save with U. S. Defense Bonds!

Now E Bonds pay 3%! Now, improved Series E Bonds start paying interest after 6 months. And average 3% interest, compounded semiannually when held to maturity! Also, all *maturing* E Bonds automatically *go on* earning—at the new rate—for 10 *more* years. Today, start investing in U.S. Series E Defense Bonds through the Payroll Savings Plan at work.

The U. S. Government does not pay for this advertisement. It is donated by this publication in cooperation with the Advertising Council and the Magazine Publishers of America.

for impressions of inlays and bridges

for partials and static full dentures

the dependable alginate impression material

– is highly e-l-a-stic

– possesses great **STRENGTH**

– insures fine impressions of high vaults and deep undercuts

– will not Slump away

– is TOUGH

– is susceptible of great *TENSION* or st-r-a-i-n without breaking

– resists shearing and tearing

– *is smooth as silk*

– is dimensionally ACCURATE

– registers microscopic detail of tooth & tissue

– costs only $2.25 for boxes of 12 half units, $4.00 for 12 full units

CALL for Super Coe-Loid at your dealer's today!

COE LABORATORIES, INC., CHICAGO 21, ILL.

"Super Absorbent" COTTON ROLLS

These improved cotton rolls are a delight to the efficient dentist and are not harsh to the patient's mouth. They are actually spun from 100% pure surgical absorbent cotton to make them softer, more pliant and noncollapsible. They adapt easily into any position, are stretchable and small tufts are quickly detachable.

DENTAL ABSORBENTS CO.
619 East Montecito St.
Santa Barbara, Calif.

FREE SAMPLE Use Coupon

Gentlemen:
Please send me a free, generous sample of DENTAL ABSORBENTS.

DR._____

STREET_____

CITY and STATE_____

A practical work of instruction based on 20,000 cases in private practice, by a leading British dental surgeon.

S. L. DRUMMOND-JACKSON

Intravenous Anaesthesia in Dentistry

'The results of Mr. Jackson's twenty years' experience make most stimulating reading which is far too valuable to be ignored. Could it be that this book marks the beginning of the general acceptance of the intravenous technique in routine dentistry?'
UNIVERSITY COLLEGE HOSPITAL DENTAL JOURNAL

$5.00

Staples Press Incorporated
70 East 45th St., New York 17, N. Y.

America's Largest Printers to the Professions

HISTACOUNT®

STATIONERY

PATIENTS' RECORDS

BOOKKEEPING SYSTEMS

FILES AND FILING SUPPLIES

For 25 years, the name *HISTACOUNT* has symbolized America's largest printer catering exclusively to the Medical profession. *HISTACOUNT* stands for highest quality at low prices, with an unconditional money-back guarantee on every item.

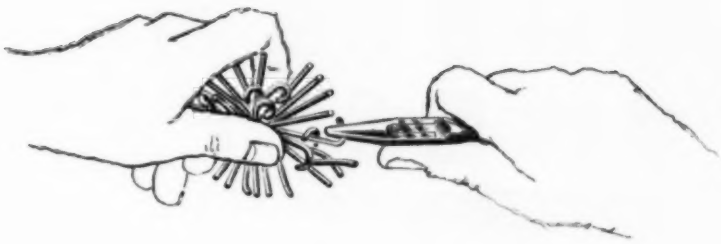
CHECK SAMPLES YOU WANT AND ATTACH COUPON TO YOUR LETTERHEAD

☐ LETTERHEADS ENVELOPES	☐ COURTESY CARDS	☐ WINDOW ENVELOPES
☐ PROFESSIONAL CARDS	☐ CONTRACT CARDS	☐ COLLECTION HELPS
☐ BILLHEADS STATEMENTS	☐ REMINDER CARDS	☐ INSTRUCTION SLIPS
☐ PRESCRIPTION BLANKS	☐ RECEIPT CARDS	☐ PATIENTS' RECORDS
☐ ANNOUNCEMENTS	☐ GUMMED LABELS	☐ BOOKKEEPING SYSTEMS
☐ APPOINTMENT CARDS	☐ DRUG ENVELOPES	☐ FILES AND SUPPLIES

MY SPECIALTY IS_____ 5-6-3

PROFESSIONAL PRINTING COMPANY, INC.
207-208 TILLARY STREET BROOKLYN 1, N. Y.

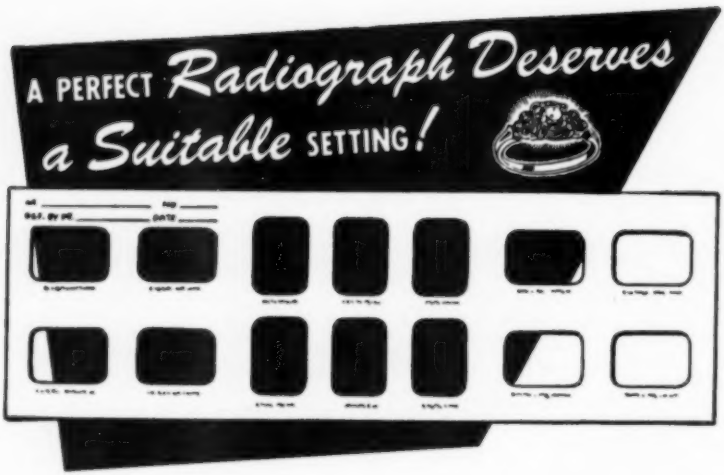
MAIL COUPON TODAY!



This Ney-Oro G-3 spoke casting
demonstrates the great
margin of safety in
dentistry's finest partial
denture gold.

Ney-Oro A-1	Ney-Oro B-2	Ney-Oro G-3
for Inlays	for Bridges	for Partials

NEY



Another RINN product for better X-Ray! **EEZEE-MOUNTS** were first designed to improve FILING . . . PROTECTION . . . HANDLING . . . VIEWING . . . and all at moderate COST! Their exclusive, TRIPLE-LAYER construction of durable quality fibreboard . . . their simplified method of insertion helped to accomplish these aims. BUT . . . another fine feature emerged with the creation of RINN EEZEE-MOUNTS . . . *good looks!* For here is the perfectly shaped frame . . . a setting of color and surface texture that interposes just the right contrast, making each X-Ray picture more attractive . . . and easier to study with a minimum of eye strain.

RINN X-RAY FILM. Standard. Full "gray scale" tone ranges disclose ALL conditions.
RINN SNAP-A-RAY. Speeds intra-oral x-ray. More parallel positioning.
RINN-O-METER. Accurate X-ray angulation instantly. Clearly marked, easily read.
RINN FAMOUS EEZEE-MOUNTS. Triple layered, durable. Filing protection.
RINN No. 3 BITE-WINGS. Better processing and packaging entirely within metallic wrap.
RINN
X-RAY PRODUCTS Inc.
2929 N. Crawford Chicago 41, Ill.
RINN HANGERS. Minimum clip-to-film contact. Super-grip quickly released. All sizes. Chemical proof.
RINN-TIMER. Avoids retakes, wasted film. Short or long ring. Shaped to fit hand.
RINN SOLUTIONS. Long lasting. Strength will not fade suddenly.
RINN THERMOMETER. Floating. Direct heat conduction. Register scale curved.
RINN PROCESSING TANK. High thermal conductivity. Fast drain. Easy to clean.

SAFE
TO BE SURE

. . . AND HANDY TOO!

Valuable papers, confidential records, narcotics or dangerous drugs . . . they're all at *your* finger-tips, but perfectly concealed and safe from outside eyes and fingers. Yes, it's the exclusive Invincible Concealed Safe unit that provides convenient security PLUS the utility of an attractive, durable Invincible Filing Cabinet.

Choose the Invincible Concealed Safe Unit in either the desk-high, counter-high, or standard four-drawer filing cabinet. Choice of letter or legal size, with or without a general lock for file drawers.

Ask your office furniture dealer or write

INVINCIBLE

INVINCIBLE METAL FURNITURE CO., MANITOWOC, WIS.

Flossy

Lasts a Lifetime

No colored paste or tooth brush cleans the 30 spaces '60' contacting sides BETWEEN teeth—where food particles lodge, ferment and decay. Why not instruct your patients to use the FLOSSY?—GUIDES floss safely with 'just a bite'—TWIST—floss comes out DIAGONAL—cleans NECKS of 2 teeth. Until this system of interdentalaxis is practiced TEETH ARE UNCLEAN. Book "Your Teeth are NEVER Clean Until Cleaned BETWEEN" FREE. SEE—'DENTAL SURPRISE TEST.'

No. 1 50c—No. 2 in Ivory Compact $1.00. 100 day Refill 25c—5 for $1.00—Want Proof? Send dollar bill for asst. postpaid—you too will condemn 'hand use floss' and score FLOSSY 54%—CTS 28% Toothbrush 18%.

We also make the BEST Amalgamator—all inclosed—silent—ivory cabinet prevents mercury spill—safe. Turn in old machines. $15.00 credit on NEW—$50.00.

Magic Rim-Cut Capsules 3+2 extras—Unit $2

228 South Wabash **FLOSSY CO.** Chicago 4, Ill.

ACCIDENT • HOSPITAL • SICKNESS
INSURANCE

For Physicians, Surgeons, Dentists Exclusively

ALL PREMIUMS COME FROM DENTISTS SURGEONS PHYSICIANS ALL BENEFITS GO TO

$5,000 accidental death — **Quarterly $8.00** **$25 weekly indemnity, accident and sickness**	**$15,000 accidental death** — **Quarterly $24.00** **$75 weekly indemnity, accident and sickness**
$10,000 accidental death — **Quarterly $16.00** **$50 weekly indemnity, accident and sickness**	**$20,000 accidental death** — **Quarterly $32.00** **$100 weekly indemnity, accident and sickness**

COST HAS NEVER EXCEEDED AMOUNTS SHOWN

ALSO HOSPITAL INSURANCE

	Single	Double	Triple	Quadruple
60 days in Hospital	5.00 per day	10.00 per day	15.00 per day	20.00 per day
30 days of Nurse at Home	5.00 per day	10.00 per day	15.00 per day	20.00 per day
Laboratory Fees in Hospital	5.00	10.00	15.00	20.00
Operating Room in Hospital	10.00	20.00	30.00	40.00
Anesthetic in Hospital	10.00	20.00	30.00	40.00
X-Ray in Hospital	10.00	20.00	30.00	40.00
Medicines in Hospital	10.00	20.00	30.00	40.00
Ambulance to or from Hospital	10.00	20.00	30.00	40.00
COSTS (Quarterly)				
Adult	2.50	5.00	7.50	10.00
Child to age 19	1.50	3.00	4.50	6.00
Child over 19	2.50	5.00	7.50	10.00

$4,000,000.00 INVESTED ASSETS

PHYSICIANS CASUALTY ASSOCIATION
PHYSICIANS HEALTH ASSOCIATION

51 years under the same management

$19,900,000.00 PAID FOR CLAIMS

400 First National Bank Building — **Omaha 2, Nebraska**

$200,000.00 deposited with State of Nebraska for protection of our members

THE
MEDICAL
PROTECTIVE
COMPANY
FORT WAYNE
INDIANA
•
PROFESSIONAL PROTECTION
EXCLUSIVELY
SINCE 1899
specialized service
assures "know-how"

READY FOR USE
Pulpdent
PAT. PENDING
ROWER
the ORIGINAL
PRE-MIXED
calcium hydroxide-
methyl cellulose paste*
for
PULP CAPPING
PULPOTOMY
CAVITY LINING
Order
from your
Dental Supply
House
*Bibliography on request
ROWER DENTAL MFG. CORP.
Boston 16, Mass. U. S. A.

A.D.A. JOURNAL FILING CASES

Keep your *Journals* efficiently and inexpensively. These cardboard cases, which are made especially to fit your *ADA Journals*, are now available in an attractive dark blue, and are designed to conform with the *Journal's* new format.

They are sold in sets of two, each of which will hold a complete volume (six issues). Numerals for the years 1950-1959 are included with each set. These are white on a blue ground, and are on gummed paper.

PRICE PER SET 75c

ORDER DEPARTMENT • AMERICAN DENTAL ASSOCIATION
222 EAST SUPERIOR STREET, CHICAGO 11, ILLINOIS

Enclosed is_____for_____sets A.D.A. L2, filing cases at 75c per set

name

address

MOSBY DENTAL BOOKS

Thoma's ORAL SURGERY

SECOND EDITION

More and more dentists have turned to Thoma's ORAL SURGERY during the past five years—as the outstanding reference in their clinical work. They use it daily because this all-encompassing text presents specific descriptions of various operating technics for the correction and elimination of all surgical diseases, injuries, and developmental abnormalities of the oral cavity, teeth, jaws, and adjacent structures—and because step-by-step illustrations of surgical treatment as well as photographs of actual cases clarify and amplify these descriptions.

They use it because the grand scope of his work—the fine attention to detail—the profuse illustrations—the abundance of explanatory text material have placed it among the classics of dental literature.

If you are not using it yet, you are missing one of the finest clinical aids in the dental literature.

In Two Volumes. 1687 Pages with 1,789 Illustrations (121 in Color). Price, $30.00

Thoma's ORAL PATHOLOGY

THIRD EDITION

An enormous amount of new material was added to this edition and new illustrations have been used to help correlate signs with microscopic findings. The material has been rearranged so that when used with the two-volume ORAL SURGERY, the pathogenesis, histopathology, and treatment of the known anomalies, diseases, and tumors of the mouth and jaws are encompassed in the author's work.

"It is all anyone could hope for in the way of a marvelous, comprehensive text for our students in Oral Pathology."
—N.A.M., D.O.S., K.C.U. School of Dentistry.

"Of course, this book represents the best work in its field."
—L.W.B., M.D., Prof. of Oral Medicine, U. of Pennsylvania.

1559 Pages, 1660 Illustrations (78 in Color). Price, $17.50

Both by KURT H. THOMA, D.M.D., F.D.S.R.C.S. (Eng.), F.D.S.R.C.S. Hon. (Edin.).
Professor of Oral Surgery, Emeritus, and Brackett;
Professor of Oral Pathology, Emeritus, Harvard University;
Honorary Professor of the Odontologic Faculty, San Carlos University, Guatemala;
Member of Board of Consultation, formerly Oral Surgeon and Chief of Dental Department, Massachusetts General Hospital, etc. etc.

Order Form

The C. V. Mosby Company, 3207 Washington Blvd., St. Louis 3, Missouri

Please send me:

Thoma's ORAL SURGERY—2nd Ed. $30.00
Thoma's ORAL PATHOLOGY—3rd Ed. 17.50

☐ Enclosed find check. ☐ Charge my account.

Name.....

Address.....

ADA 6-53

19% Consumer food dollar spent for dairy foods

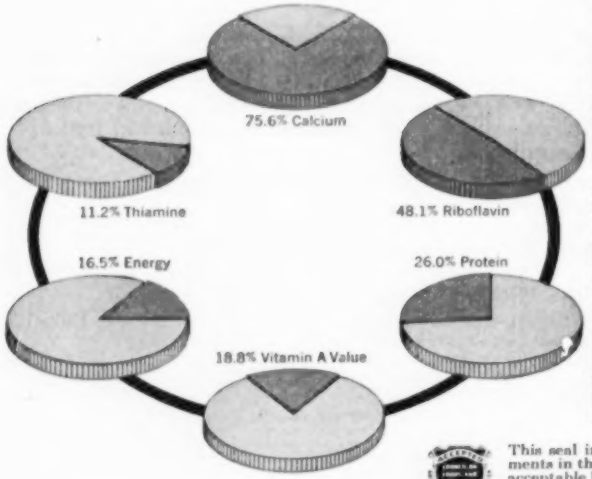
Milk, cheese, ice cream and butter cost Americans *less* than one-fifth of their food dollar.[1]

Returns from this investment in dairy foods are high, for they provide a large supply of important nutrients. For instance, more than three-fourths of the calcium available per person per day in the United States comes from dairy foods. These same foods also provide nearly one-half of our riboflavin and more than one-fourth of our protein.[2]

Calculations of the national food supply do not allow for either loss or waste in the home. Since there is no waste in dairy foods, they can be counted on to provide their full quota of nutrients.

AN ECONOMICAL INVESTMENT IN GOOD HEALTH

Percent of various nutrients in our national food supply provided by all dairy foods.



Not only the *quantity* but the *quality* of the nutrients in dairy foods is important. No calcium is better utilized than that of milk. The riboflavin of ice cream has been shown to be almost 100 per cent available to the body.[3] The protein of milk, cheese, and ice cream is well utilized for growth and maintenance of body tissue. Butter and the butterfat in dairy foods supply about one-fifth of the vitamin A in our national food supply.[2]

Milk and milk products are a good food buy, nutritionally and economically.

[1]The Marketing and Transportation Situation, Bureau of Agricultural Economics, U.S.D.A. (March-April) 1952.

[2]Data from Bureau of Human Nutrition and Home Economics, U.S.D.A., 1952.

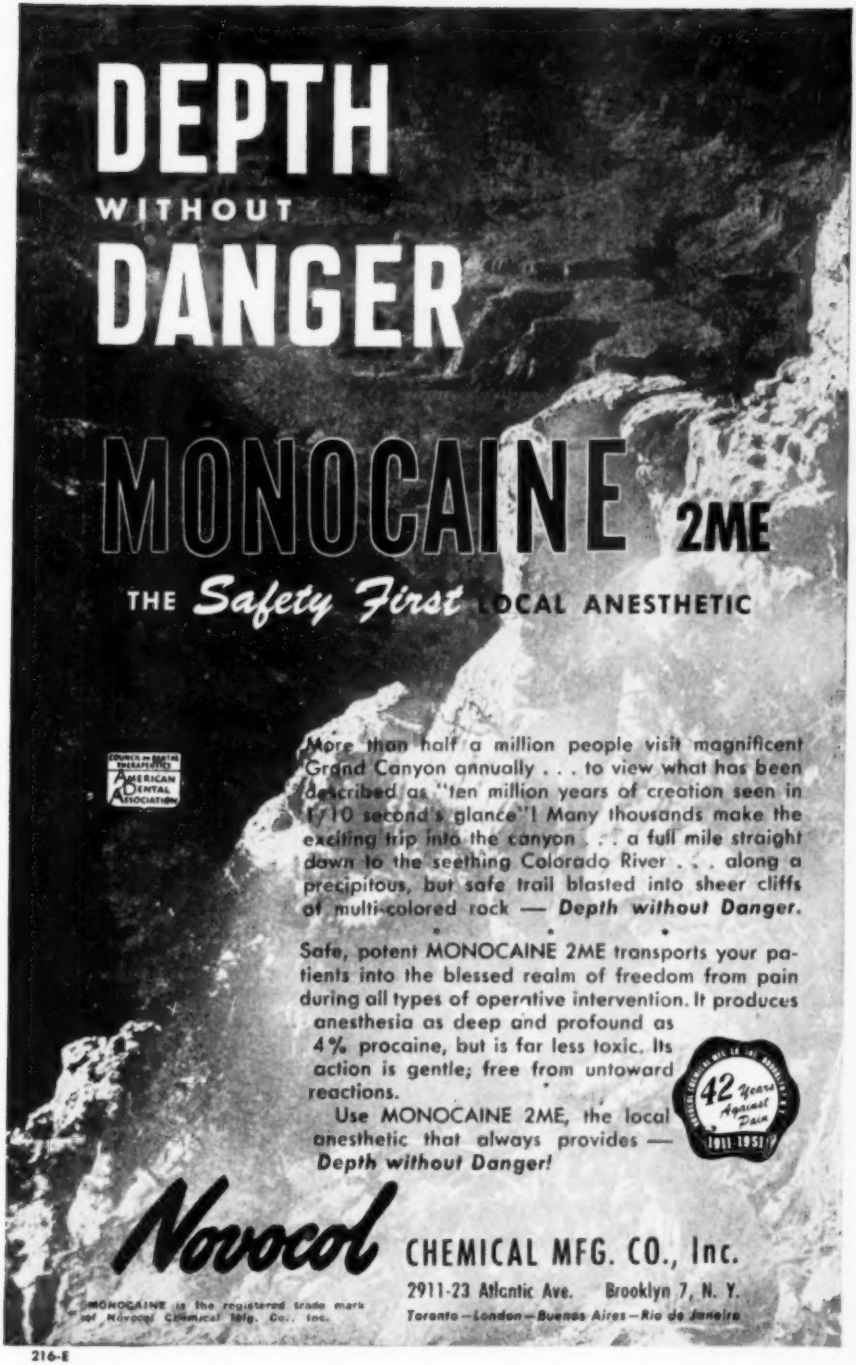
[3]Everson, G., Wheeler, E., Walker, H., and Caulfield, W. J.: Availability of riboflavin of ice cream, peas, and almonds, judged by urinary excretion of the vitamin by women subjects. J. Nutr. *35*:209 (Feb.) 1948.

This seal indicates that all nutrition statements in the advertisement have been found acceptable by the Council on Foods and Nutrition of the American Medical Association.

NATIONAL DAIRY COUNCIL

111 NORTH CANAL STREET • CHICAGO 6, ILLINOIS

Since 1915 . . . the National Dairy Council, a non-profit organization, has been devoted to nutrition research and education to extend the use of dairy products.


DEPTH
WITHOUT
DANGER
MONOCAINE 2ME
THE Safety First LOCAL ANESTHETIC
AMERICAN DENTAL ASSOCIATION
More than half a million people visit magnificent Grand Canyon annually . . . to view what has been described as "ten million years of creation seen in 1/10 second's glance"! Many thousands make the exciting trip into the canyon . . . a full mile straight down to the seething Colorado River . . . along a precipitous, but safe trail blasted into sheer cliffs of multi-colored rock — Depth without Danger.
Safe, potent MONOCAINE 2ME transports your patients into the blessed realm of freedom from pain during all types of operative intervention. It produces anesthesia as deep and profound as 4% procaine, but is far less toxic. Its action is gentle; free from untoward reactions.
Use MONOCAINE 2ME, the local anesthetic that always provides — Depth without Danger!
42 Years Against Pain
1911-1951
Novocol
CHEMICAL MFG. CO., Inc.
2911-23 Atlantic Ave. Brooklyn 7, N. Y.
Toronto—London—Buenos Aires—Rio de Janeiro
MONOCAINE is the registered trade mark of Novocol Chemical Mfg. Co., Inc.

216-E

FIT—for a King!

Ticonium is cast to fit!

Put away those pliers! You won't have to plier-fit your Ticonium cases. They're "fit" for a king!

You'll thrill at the "go-into-place" accuracy of Ticonium. It's no guess-work. Every step in the Ticonium technique is planned to give you precision inlay-accuracy. **Try TICONIUM!**

For cases that FIT . . . specify **TICONIUM**
413 N. Pearl Street, Albany, N. Y.

Ticonium cases

F *ine grain*
I *nlay accuracy*
T *i-lectro polished*

DENTISTS EVERYWHERE
ARE ENTHUSIASTIC OVER

THE RADIOSURG

Indicated in the NEW Science of MOUTH RECONSTRUCTION TECHNIQUES

INDISPENSABLE AS AN AID IN

- **CROWN AND BRIDGE TECHNIQUES**
- **HYDROCOLLOID TECHNIQUES**
- **PERIODONTIA TECHNIQUES**
- **GINGIVOPLASTY**
- **PROSTHETIC TECHNIQUES**
- **RESTORATIVE TECHNIQUES**
- **ORAL SURGERY**

AND

FOR MANY OTHER APPROACHES DESIGNED TO FACILITATE YOUR PRACTICE. Write for detailed description and AUTHORITATIVE REPRINTS OF TECHNIQUES.

(Other Models Available in Various Price Ranges)

MODEL R-1 RADIOSURG

COLES CORPORATION

3212 Market Street **PHILADELPHIA 4, PA., U.S.A.**

ALL MODELS DISPLAYED AT YOUR STATE AND ADA MEETINGS
AVAILABLE THROUGH RESPONSIBLE DEALERS
(Accepted by Council of Physical Medicine, A.M.A.)

The Journal of Oral Surgery

is for you!

Whether you have a general practitioner's interest in oral surgery or specialize in this important field of dentistry . . . the JOURNAL OF ORAL SURGERY is for YOU. It is packed with practical articles you'll find invaluable. It is concerned with theory and practice, with case reports, with answers to your queries, with reviews and recommendations you'll find helpful. Edited by Frederick A. Henny, DDS, this informative, well-illustrated Quarterly Publication of the American Dental Association will keep you posted on all that's new and worthy of your attention.

SEND IN YOUR SUBSCRIPTION TODAY. ONLY $8 PER YEAR

Subscription Department, AMERICAN DENTAL ASSOCIATION
222 E. Superior Street, Chicago 11, Illinois

Please enter my subscription to the JOURNAL OF ORAL SURGERY for one year at $8.00. My remittance is enclosed. Add $1.00 for foreign subscriptions.

Name.....
(Please type or print)

Address.....
Number Street

.....
City Zone State

CLASSIFIED ADVERTISING

Forms close on 25th of second month preceding month of issue

Remittance Must Accompany Classified Ads.

Advertisements cost $3.50 not exceeding 30 words, additional words 10c each. Commercial agency advertisements, $3.50 for 20 words, additional words 13c each. Publisher reserves the right to determine classification. An extra fee of 25c is charged advertisers who have answers sent care of A.D.A. and in such cases we do not furnish name or address to inquirers. This rate applies for each insertion.

PRACTICES AND OFFICES FOR SALE

CALIFORNIA—Established lucrative general practice in Dinuba, Calif. Located in new medical building. Modern, two-chair, well equipped. Reason: specializing. Direct replies to Dr. Van M. Graves, 96 West 47th St., Long Beach, Calif.

●

CALIFORNIA—Stanislaus County. Excellent opportunity. Two-story, two baths, suitable for combination home and dental office; two-car garage. Corner location. Block from business area. Reason for selling: owner retiring. Very reasonable. Address A.D.A. Box No. 468.

●

COLORADO—Completely equipped one-chair dental office in University town of 24,000 needing a dentist. Lies at foot of mountains. Excellent downtown location. Plenty of office space for expansion to make two-chair office. Rent $50.00 per month. Address A.D.A. Box No. 455.

●

COLORADO—For Sale. Established practice in Colorado town of 15,000. Pleasant town in which to live; fine people; wonderful year-round climate; good fishing and hunting. What's more, you can make money immediately. Address A.D.A. Box No. 208.

●

CONNECTICUT—Oral surgery office for sale. Excellent opportunity. Please give all details in reply. Address A.D.A. Box No. 456.

●

ILLINOIS—For Sale. Two-chair bungalow office; modern equipment. Gross $35,000. Northwest suburb of Chicago. Leaving for Service. Address A.D.A. Box No. 457.

●

ILLINOIS—An unusual opportunity. Fully equipped dental office and practice. Operating room, business office, reception room and full-time receptionist for $75.00 per month. Also associated with Optometrist in same suite. Address A.D.A. Box No. 458.

●

ILLINOIS—Dental office, fully equipped for exodontia, and practice (the specialty of exodontia practiced for 25 years with a splendid following in this location). All necessary equipment for anesthesia. 31 North State St. Room 906. Direct replies to Mabel C. McDaniel, R.N., 1419 East 60th St., Chicago 37, Ill. Phone MIdway 3-5481.

●

ILLINOIS—Two-chair, completely equipped dental office for sale in central Illinois town of 1,100 urgently desiring a dentist. Direct replies to 1st Lt. D. E. Killip, U. S. Army Hospital D. C., Fort Riley, Kansas.

●

KANSAS—Modern two-chair office for sale. Ritter Motor Chair and X-Ray, S. S. White Motor Chair and Master Unit, American Cabinets, Castle lights, everything the best. Community of 10,000 with 40,000 drawing area 50 miles south of Wichita. Seven dentists, only one under 50. A Professional Budget Plan office where you will be limited only by your own ability. Will help finance. Will work for you until you are on your feet. A golden opportunity. Direct replies to Dr. J. G. McCue, Jr., 515-18 State Bank Bldg., Winfield, Kans.

NEW JERSEY—Bergen County. Active practice in progressive and rapidly growing community. Metropolitan area. Wonderful opportunity. Owner service bound. Address A.D.A. Box No. 459.

●

NEW JERSEY—Profitable general practice, established 22 years, situated in downtown office building, Broad Street, Newark. Reasonable. Equipment optional. Will stay to introduce clientele. Address A.D.A. Box No. 460.

●

NEW YORK—Fully equipped dental office in cooperative Professional Building in Kings County. Two operating rooms, reception room, business office and lounge. Accessible transportation from all parts of the city. Address A.D.A. Box No. 461.

●

NEW YORK—Brooklyn. Completely equipped two-chair office and corner income building, two garages. Ground floor rented to commercial tenants. Price $30,000; half cash, balance 25 year mortgage. Income from corner luncheonette covers mortgage. Owner leaving country. Serious inquiries only. Address A.D.A. Box No. 462.

●

NEW YORK—Well established, profitable general practice. Well equipped combination home and office. Unusual opportunity for man experienced in gas anaesthesia. Suburb of Buffalo on Route 20. Retiring. Address A.D.A. Box No. 463.

●

NEW YORK—Long Island. Includes practice. Busy, prominent corner. Town population 20,000, county seat, near station. Fully equipped spacious rooms, long lease. Reasonable for quick sale because of illness. Address A.D.A. Box No. 464.

●

NEW YORK—Active dental practice with fully equipped office. Desirable mid-town location in New York City. Retiring. Address A.D.A. Box No. 465.

●

NEW YORK—Long Island, 75 miles out. Substantial pre-war home, 10 rooms, 2½ baths, automatic heat, slate roof, double garage, 8-room office bungalow, two chairs, Ritter units; long established. $40,000; half cash, balance 20 years. Address A.D.A. Box No. 443.

●

OHIO—Established practice and equipment in a Professional Building, Toledo. Available in June. Address A.D.A. Box No. 331.

●

VERMONT—Extremely lucrative active dental practice of recently deceased dentist, for sale; fully equipped; three chairs; wonderful opportunity. Direct replies to Mrs. Sumner S. Firestone, 41 Elsom Parkway, Burlington, Vt. Phone 4-7119.

●

WEST VIRGINIA—Established modern fully equipped two-chair office. Choice location in city of northern panhandle of W. Va. Reason for selling: owner returning to school for extensive specialty work. Address A.D.A. Box No. 466.

WISCONSIN—Dentist badly needed for central Wisconsin city of 2,400. Modern two-chair office. No competition. Address A.D.A. Box No. 467.

OPPORTUNITIES AVAILABLE

ILLINOIS—Wanted: An associate with general practitioner in clinic, northern Illinois. Early inquiry necessary. Address A.D.A. Box No. 469.

●

INDIANA—Wanted: Associate dentist in general dentistry. All modern office; four operating rooms. Indiana city of 60,000. First year potential, $22,000. Give details about self and availability in first letter. Address A.D.A. Box No. 470.

●

INDIANA—Wanted: Associate hygienist. All modern office; four operating rooms. Indiana city of 60,000. Give details about self and availability in first letter. Address A.D.A. Box No. 471.

●

MARYLAND—Dentist with Maryland license to take over well-established practice in modern air-conditioned office while owner is in service. Will make attractive offer. Direct replies to Dr. Sidney Lieberman, 2406 Eutaw Place, Baltimore 17, Md.

●

MARYLAND—Dental hygienist, Maryland licensed, for highly desirable private practice in modern office. $70.00 weekly to start. Three weeks vacation with pay. Address A.D.A. Box No. 445.

●

NEW YORK—Priority three dentist may enter service shortly. Would like replacement to run office in small central New York village for two years. Address A.D.A. Box No. 447.

●

NEW YORK—Associate for General Practice, percentage basis increasing each year. Guarantee yearly salary. Associate to retain all patients. Send full particulars in first letter. Address A.D.A. Box. 472.

●

NEW YORK—Orthodontist desires associate who would succeed to practice, upstate N. Y. Please state qualifications in letter; all to be considered confidential. Address A.D.A. Box No. 473.

●

OHIO—Wanted: Dentist to associate with group of physicians in a small Ohio city. Address A.D.A. Box No. 215.

●

OHIO—Dentist. Because of the death of former associate with me 12 years, urgently require permanent associate for dowrtown Dayton practice. Substantial salary and also commission. Direct replies to Dr. J. H. Boyles, 139 S. Main St., Dayton, O. Telephone Michigan 0393.

●

WYOMING—Kemmerer. Town and area of 4,000 population direly needs an additional practicing dentist. Office space available. For details, direct replies to Box 269, Kemmerer, Wyo.

LOCATIONS AVAILABLE

CONNECTICUT—Professional bungalow, 2½ or 3½ rooms, share reception room with established dentist-owner. Main thoroughfare. Contiguous to business center. Ideal location. Direct replies to Dr. Eugene M. Gane, 1010 Farmington Ave., West Hartford, Conn.

FLORIDA — Established general practice. Air-conditioned office; new building; common reception room. Dental suite approximately 14 x 38 ft. Direct replies to Bernard Yesner, M.D., 5607 S.W. 8th St., Miami 44, Fla.

●

FLORIDA—For lease, a fully equipped two-chair dental office. Entering service for two years. Busy practice in good section of Miami. Address A.D.A. Box No. 474.

OPPORTUNITIES WANTED

1949 Graduate completing service with Air Force July, 1953. Rotating dental internship 1949-1950. Is competent and enjoys all phases of dentistry. Interested in association or buy practice in home state Michigan, preferably Grand Rapids area. Address A.D.A. Box No. 449.

●

ORAL SURGEON—Two year straight internship; one year Graduate School of Medicine; one year residency; 26 months Chief of Oral Surgery, U. S. Army Hospital. Eligible for certification, M.Sc. New York, Pennsylvania license, will take additional. Desires association. Go anywhere. Address A.D.A. Box No. 450.

●

DENTIST—Age 31, married, 1946 graduate, being discharged from service July 1, 1953. Licensed New York and Connecticut. Will consider taking other Boards if necessary. Excellent general background especially operative, exodontia and pedodontia. Would consider only private practice. Address A.D.A. Box No. 475.

●

ANAESTHETIST—Wishes position in established ethical oral surgeon's office. Nitrous oxide & oxygen McKesson machine. Long experience. Will travel. Write full particulars. Address A.D.A. Box No. 476.

●

DENTIST—Recent graduate; returning from 24 months service; available immediately; desires rent or purchase practice northern or western Chicago suburb or northern Illinois. Address A.D.A. Box No. 477.

●

DENTIST—Desires association with busy general practitioner, oral surgeon or combination. Well trained, stable, responsible and personable young dentist completing military service with adequate clinical and hospital experience interested in good dentistry. Married with two children, 31 years of age and licensed in Illinois; but will consider taking State Board. Direct replies to Dr. Robert B. Mattes, 5012 Army Service Unit, Fort Sheridan, Ill.

●

Capable young dentist desires to associate or purchase general practice, or other opportunity to start practice in Wisconsin. 1951 graduate, returning from service, available in September. Address A.D.A. Box No. 478.

MISCELLANEOUS

NEW ITEMS DEVELOPED—Send us your ideas (drawings, patents, models, etc.). We will investigate manufacturing possibilities, sales potential, conduct market survey, etc. Have connection with a well-known, reputable manufacturer. All ideas kept in strict confidence. Address A.D.A. Box No. 131.

●

WANTED TO BUY—Old or used dental books or journals. Leo L. Bruder, 1 DeKalb Ave., Dept. 21, Brooklyn, N. Y. Dealer in out-of-print dental literature.

●

WANTED TO BUY—Old dental books, journals, pamphlets and all items pertaining to dentistry. P. O. Box 1218, New Haven, Connecticut.

SOLID BRONZE NAME SIGNS

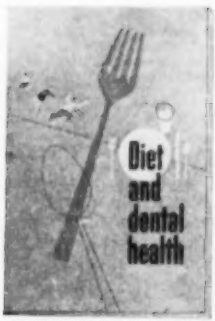
DR. N. B. SCHERR
DENTIST

Cast, raised letters, drilled, with screws

3" x 12" — $10.80	3" x 14" — $12.60	3" x 16" — $14.40
4" x 14" — $16.80	4" x 16" — $19.20	4" x 18" — $21.60
5" x 16" — $24.00	5" x 18" — $27.00	5" x 20" — $30.00
6" x 18" — $32.40	6" x 20" — $36.00	6" x 25" — $45.00

Other sizes 30c per square inch. Signs with wording on both sides 45c per square inch.
COLLECT PLEASE SEND CHECK WITH ORDER

LAUER METAL SHOP · 1516 E. Baltimore Street · Baltimore 31, Md.



WHEN YOUR PATIENTS WANT TO KNOW ABOUT DIET—

ada

Be prepared with a supply of "Diet and Dental Health"—a 16-page pamphlet that answers patients' questions in lay language. Authoritatively written, "Diet and Dental Health" contains the latest and best information on a subject in which there is great patient interest. Get a supply today!

A free, sample copy will be sent on request.

Order Department, AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois

Prices for P-12 DIET AND DENTAL HEALTH:

☐ *25 Copies.....$ 2.00*
☐ *50 Copies.....$ 3.25*
☐ *100 Copies.....$ 5.75*

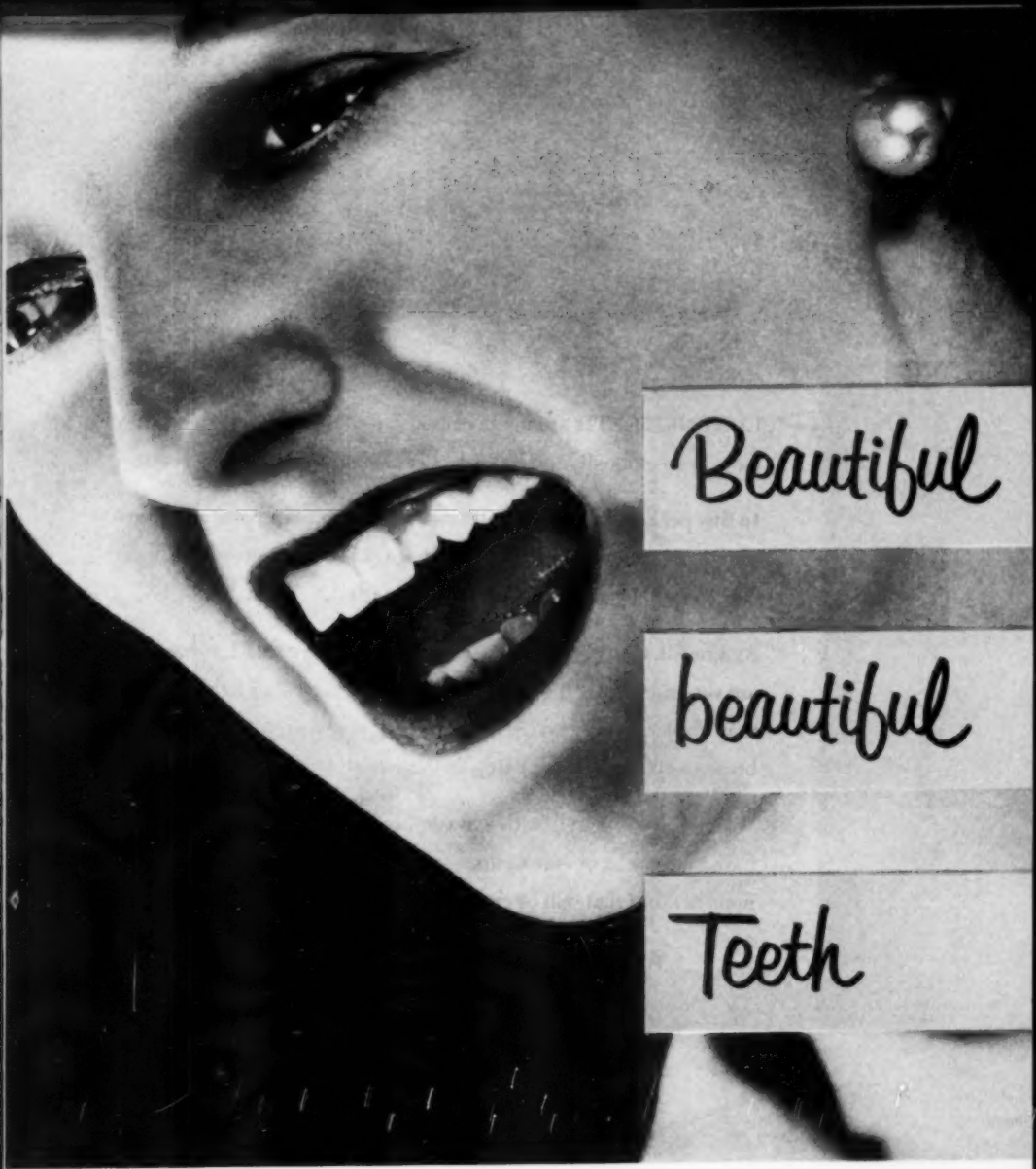
Please send remittance with order.

name _____

address _____

city, zone, state _____

please type or print



let's talk about . . . Teeth

Here's Why LUXENE VINYL TEETH have

LUXENE TEETH are made of "vinylite"* resin material and they have been clinically tested for a period of approximately 6 years.

In this period of time we have found no instance of breakage, chipping or crazing. When compared with other plastic teeth for wear resistance they surpass all other teeth tested.

As a result, many professional co-workers believe that Luxene teeth are superior to all other plastic teeth on the market and they believe that these teeth are indicated when opposed to natural teeth because they are more resilient than porcelain and reduce shock.

When Luxene vinyl teeth are combined with Luxene 44 denture base material, a chemical union results, which provides a homogenous denture that will be entirely sanitary for the life of the denture.

- ★ LUXENE TEETH are manufactured in six popular shades and a shade guide is available on request.
- ★ Because of the toughness of Luxene 44 denture material, the All Luxene Denture can be made with less bulk to provide more tongue room and greater mouth comfort.
- ★ The Professional Aid Kit, as illustrated, will enable you to demonstrate some of the important features of the All Luxene Denture.

*Trade Mark Registered

proven their worth after 6 years of clinic testing!

This illustration shows the doctor demonstrating the toughness test to the patient.

This illustration shows the patient making the toughness test for herself.

Beautiful beautiful Teeth

The All Luxene Denture, that is, Luxene Vinyl Teeth with Luxene 44 denture material, produces the finest dentures available. If you desire a demonstration of the Professional Aid Kit and the simple test for material toughness, you may obtain same by calling your nearest Luxene Selected Laboratory.

"...and be sure to take your VITAMINS!"

Extensive exodontia, particularly in the elderly patient, imposes increased vitamin requirements for tissue repair at a time when vitamin intake is understandably low. A balanced vitamin preparation is a dependable way to guard the patient's nutritional status.

MERCK & CO., INC., RAHWAY, N.J.—as a pioneer manufacturer of Vitamins—serves the Dental Profession through the Pharmaceutical Industry.

© Merck & Co., Inc.

Johnnie's willingness to "take a chance" will lead to embarrassing consequences, because he's not careful.

Novice denture wearers, too, usually find it expedient to take every possible precaution to avoid painfully embarrassing accidents. They appreciate the suggestion of Wernet's Powder during the difficult period of adaptation, to strengthen their self-confidence by

WERNET DENTAL MFG. CO., Inc.

Wernet's Powder

hands!"

providing an extra measure of reassurance.

Wernet's Powder hastens the achievement of manipulative skill, by its improvement of stability and retention. It helps reduce initial discomforts, too, by its soft, resilient cushion. Particularly when the adjustment problem is aggravated by anatomical handicaps or psychological difficulties, it encourages patience and perseverance.

JERSEY CITY 2, NEW JERSEY

Speeds the Mastery of the Denture

WERNET DENTAL LORE

JUNE 1953

Population growth seems to be winning the race against growth in the ranks of dentistry. As against 1815 persons per dentist in 1947, there are 2000 per dentist today. Indeed, it is estimated that dental schools would have to graduate at least 400 *more* dentists per year than now, just to keep abreast of the increasing population.

• • •

The history of caries treatment has gone through as many evolutionary stages apparently as the history of the human race itself. Celsus (circa 90 AD) was one of the many down the ages who attempted a prescription to prevent tooth decay. His was called "Sory" (no relation to "so sorry!"), and contained poppyseeds, pepper and copper sulfate, made into a paste with galbanum.

• • •

In spite of the unusually high degree of civilization achieved by the Mayan culture, history records no dentists as such among them. Inlays found in the teeth of Mayan skulls were the work of artisans dedicated to the making of jewelry and pottery.

• • •

The first scientific text devoted entirely to a discussion of the anatomy of the teeth was contributed in 1563 by the Italian Bartholomaeus Eustachius—better known for his description of the Eustachian tube of the ear and the Eustachian valve of the heart.

• • •

It was F. H. Balkwill, who in 1866 first studied the engineering principles underlying the mechanism of masticatory action, thus laying the foundation for the functional soundness of the modern artificial denture.

• • •

Karaya Gum, formerly known as Indian Gum, is considered far superior to Tragacanth Gum for many purposes. Solutions of Karaya, when applied to the skin, produce a more pleasing effect than the "mucilage" of Tragacanth. That's why, during recent years, Karaya has become so popular in the preparation of many medical compounds. Its excellent qualities enhance the virtues of Wernet's Powder of which it forms the base.

FREE PROFESSIONAL SAMPLES

WERNET DENTAL MFG. CO., INC., Jersey City 2, N. J.

Please send me professional samples of Wernet's Powder. 11-F

Dr._____
PLEASE PRINT

Address_____

City_____ Zone____ State_____

OPOTOW
JELSET
IMPRESSION POWDER

an elastic material
which will provide an
accurate reproduction of
the impression area

OPOTOW
MANDIBULAR and
PERIPHERAL PASTE
(M & P)

with controlled flow–
will not move until
in contact with tissue

PRACTICAL, PROVEN FORMULAS . .

OPOTOW
IMPRESSION PASTE

the standard for
full impressions,
re-bases and washes

Buy the

"IMPRESSION PROCEDURE PACKAGE"

Now available at all dental depots

Interstate DENTAL CO., INC.

220 WEST 42 STREET • NEW YORK 36, N. Y.

NO BRIDGE IS STRONGER THAN THE METAL IN ITS ABUTMENTS

BAKER REGULAR AND CUSHION SPRING

PRECISION ATTACHMENTS

Baker Precision Attachments in 3 sizes for Anterior Bicuspid and Molar are made of Orthoclasp #2 Wire Alloy. Fuses at 2732°F. Brinell of 245.

All Baker Precision Attachments can be used in any location in the mouth. However, the left and right Cushion Spring Type are recommended when using clasp or lingual arm rests because they are so easy to adjust to the exact, delicate amount of permanent spring tension required, with an ordinary penknife blade.

The extraordinary resiliency of the hard, wear-resistant Orthoclasp #2 Wire Alloy eliminates the need of continued adjustments. They do not oxidize and can be soldered or cast against with definite assurance that the very hard, high fusing box will not warp.

All mandrels, posts and boxes are interchangeable. Be sure when ordering to state if mandrels are required.

Baker Split Pin Denture Attachments are supplied in 14 and 16 gauge, mandrels included. Their mouth efficiency and value in eliminating unsightly clasps from inexpensive partial dentures has been proven over many years of successful mouth service.

For cases you will be proud to see in years to come, we recommend Baker Chicago 4 for gold-colored cases and Baker 14% Casting Gold for platinum-colored cases.

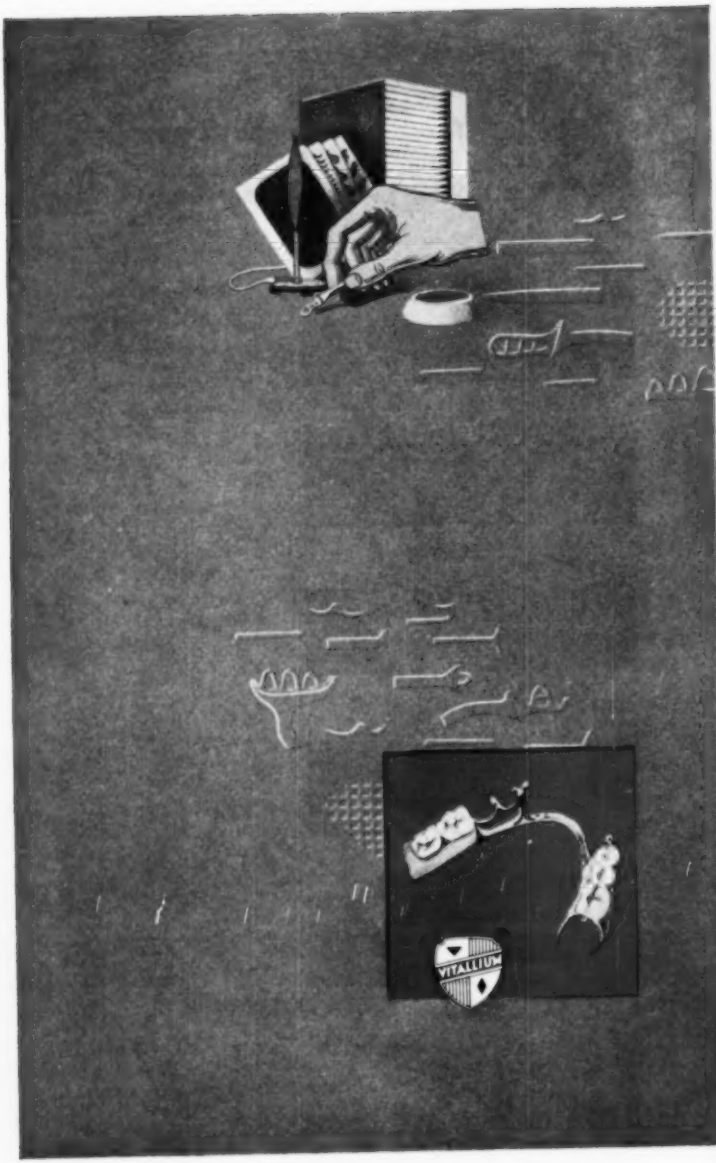
If your dealer does not handle Baker Golds, order direct giving us your dealer's name.

BAKER & CO., INC.

850 PASSAIC AVENUE, EAST NEWARK, NEW JERSEY

BAKER

THE WORLD'S LARGEST WORKERS AND REFINERS OF PRECIOUS METALS


VITALLIUM

Vitallium

Quality Controlled for 21 Years

Flexseal ADAPTATION...

Third LABORATORY STEP FOR

PATIENT COMFORT AND UNIFORM STRENGTH

Following design and model duplication, the third laboratory step—Flexseal adaptation—provides the denture with its basic essential framework. Flexseals are the original plastic, pre-forms developed to supplant free-hand waxing of important denture sections and to eliminate the attendant bugaboos—"highs and lows", over-grinding and other possible errors in judgment.

Flexseal patterns are mechanically precise in their gauge and contour, uniform in dimensions, and mechanically precise in the taper of clasps. They are assurance of requisite strength and rigidity without undue bulk. Rigid quality controls, employed in fabricating the Flexseals, are reflected in the superb adaptation of the denture, in its light weight, jewel-like detail and matchless function, comfortable in the mouth and long-lasting in satisfaction.

® By Austenal Laboratories, Inc.

AUSTENAL LABORATORIES, INC.

New York 16, N.Y. Chicago 21, Ill.

THERE IS AN OUTSTANDING VITALLIUM LABORATORY NEAR YOU

Lengthwise fibers of pure, uncoated cotton held securely in shape by thin strands of fine, soft thread, sealed at every crossing

RICHMOND
DENTAL COTTON ROLLS

This completely new type of all-cotton roll brings you advantages no other roll can offer:

The natural softness and pliability of pure absorbent cotton, free of any stiff coating material. Greater absorbency, because the all-cotton surface comes in immediate contact with the saliva. Complete protection against seepage, since these rolls fit the buccal curvature snugly and comfortably, without forming stiff, harsh wrinkles. Freedom from chemical or mechanical irritation during use and upon removal . . . Richmond Rolls never stick to the oral mucosa or pull off bits of tissue.

•

SUPPLIED in three sizes, Large, Medium and Small, in 6 inch and 1½ inch lengths.
Sterilized after packaging.

Write for a generous testing sample.

RICHMOND DENTAL COTTON COMPANY

Box 2176, Charlotte 1, N. C.

We also carry a full line of pellets and pellet dispensers.

5082

'SEVRITON' the new plastic filling material that really *Stays Put*

Developed by de Trey's world-famous research laboratories, 'Sevriton' at last overcomes the known frailties associated with plastic resin filling materials. The Cavity Seal provides a bond between 'Sevriton' and tooth tissue so perfect that a cavity once filled is there to stay! Three years of tests in actual practices in Europe have established this fact.

The shading and blending of 'Sevriton' make restorations difficult to detect. Further, 'Sevriton' plastic filling material will not discolor in the mouth!

De Trey's 'Sevriton' is truly what you've always looked for in a plastic filling material — order a supply today!

Write for free illustrated booklet today.

'SEVRITON' — an 'AMALGAMATED DENTAL' product developed by DE TREY Frères, S. A., Zurich, Switzerland — is made in England and is a registered trademark.

Claudius Ash, Sons & Co., U.S.A., Inc.

Distributors to the Dental Trade in the U.S.A.

127-131 Colt Street **Irvington 11, N.J.**

ONE OF THE AMALGAMATED DENTAL GROUP OF COMPANIES

Positive Adaptation Long-Lasting Restorations with the

Kadon "*Brush On*" Technic

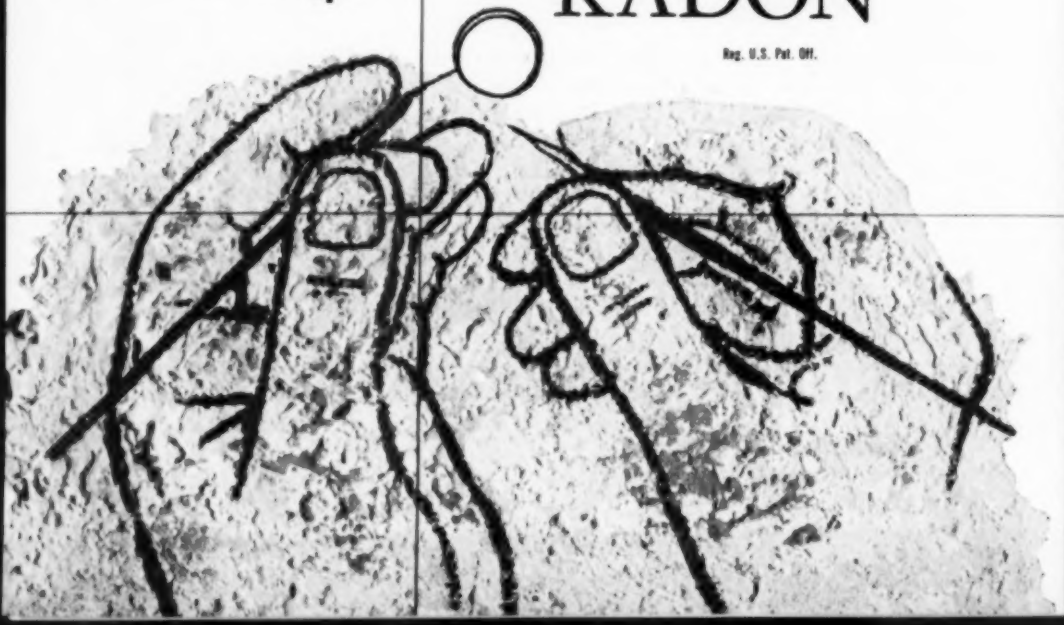
Combining Kadon powder and liquid *inside the cavity* by means of a brush is the newest, most successful technic for applying this durable filling material. Because the material literally flows into place in successive layers, maximum adaptation is obtained . . . without matrix or clamps, and with a welcome saving in chair time. Kadon's high heat-rise assures quick setting of each "Brush On" layer. The result is a truly homogeneous filling which combines all the good qualities that have made Kadon restorations an outstanding success in five years of clinical experience!

The KADON APPLICATION KIT

Flint glass dispensing tray
Six detachable brushes (3 medium, 3 small; all can be sterilized)
Two aluminum handles with tapering shanks slotted to fit brushes **$4.75**

KADON

Reg. U.S. Pat. Off.



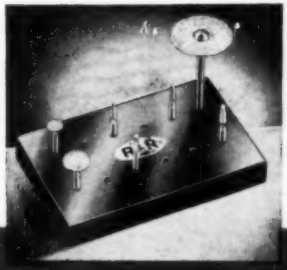
..Buy 6.. Get 7

...in the

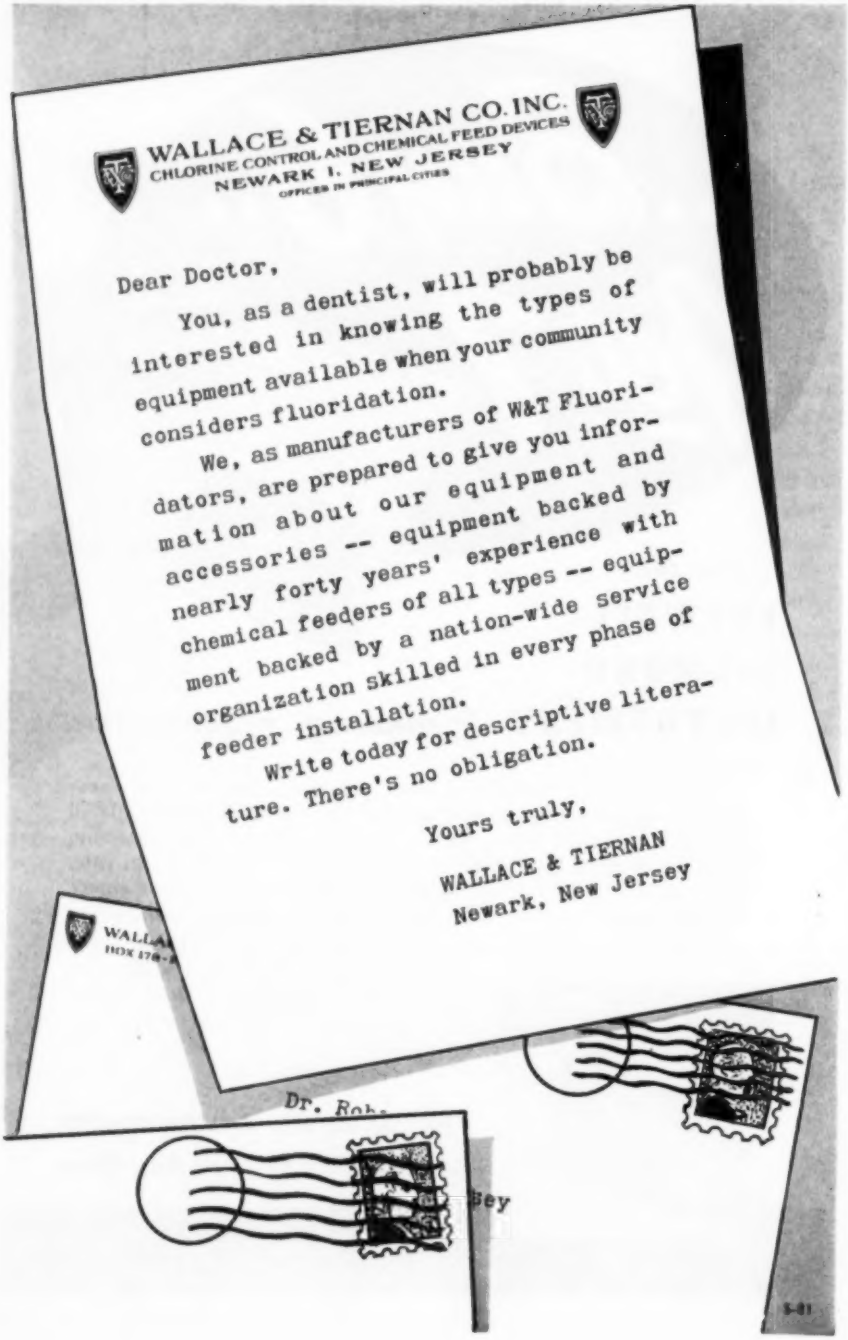
CUTWELL DIAMOND INSTRUMENT *Economy Assortment*

Here is a worth-while inducement for you to discover for yourself the superior cutting efficiency and durability of R & R Cutwell TRIBOND Diamond Instruments. For in addition to any selection of six instruments you order at the money-saving half-dozen rate, you can obtain FREE any additional instrument of your choice from the comprehensive Cutwell line, no matter what its regular price!

Take the first opportunity to look over the wide range of types and sizes of instruments available, so you can make your own selection and take advantage of this generous "get acquainted" offer. The handy instrument holder is included.



THE RANSOM & RANDOLPH COMPANY • Toledo, Ohio



WALLACE & TIERNAN CO. INC.
CHLORINE CONTROL AND CHEMICAL FEED DEVICES
NEWARK 1, NEW JERSEY
OFFICES IN PRINCIPAL CITIES

Dear Doctor,

You, as a dentist, will probably be interested in knowing the types of equipment available when your community considers fluoridation.

We, as manufacturers of W&T Fluoridators, are prepared to give you information about our equipment and accessories -- equipment backed by nearly forty years' experience with chemical feeders of all types -- equipment backed by a nation-wide service organization skilled in every phase of feeder installation.

Write today for descriptive literature. There's no obligation.

Yours truly,

WALLACE & TIERNAN
Newark, New Jersey

Dr. Rob

Bey

1-61

ASSOCIATION PLAN

Accident and Health Insurance

THIS IS THE ONLY PLAN OF ACCIDENT AND HEALTH INSURANCE ENDORSED OR APPROVED BY THE AMERICAN DENTAL ASSOCIATION

★★★★

BRIEF OUTLINE OF COVERAGE

Accident Benefits —Full monthly benefit for total disability, from FIRST DAY, limit 60 months. **One-half monthly benefit for partial disability, limit 6 months.** Limit of time for total and partial combined 60 months.

Sickness Benefits —Full monthly benefit for total disability commencing with Eighth day of disability, limit 24 months, **house confinement not required.**

Individual Termination —The insurance of each insured member will continue in force concurrently with the group policy and may only be terminated by reason of any of the following conditions:

a. If the group policy is terminated.

b. If the insured member fails to pay the required premium.

c. If the insured member ceases to be a member of the American Dental Association

d. If the insured member retires or ceases to be actively engaged in the dental profession.

★★★★

PREMIUM RATES

(Applicable to ages at entry and attained at annual renewal of insurance)

			SEMI-ANNUAL RATES		
Monthly Benefits	**Accidental Death Benefit**	**Dismemberment Benefits**	**Ages Up To 50**	**Ages 50 to 60**	**Ages** 60 to 65**
$100.00	**$3,000.00**	**$ 5,000.00**	**$16.05**	**$18.30**	**$22.80**
$200.00	**3,000.00**	**10,000.00**	**30.15**	**34.65**	**43.65**
$300.00	**3,000.00**	**15,000.00**	**44.25**	**51.00**	**64.50**
$400.00	**3,000.00**	**20,000.00**	**58.35**	**67.35**	**85.35**

Premiums will be billed half-yearly.

**Although the age limit for acceptance of risks is the 65th birthday, once issued, there is no termination age limit for renewal.

If you are not now insured under the ASSOCIATION PLAN, communicate with the Trustee of the Policy Dr. Paul W. Zillmann, 29 Walden Avenue, Buffalo 11, N. Y., or with M. A. Gesner Inc. 150 East Superior St., Chicago 11, Ill.

★★★★

Issued Exclusively by

NATIONAL CASUALTY COMPANY of Detroit

Through

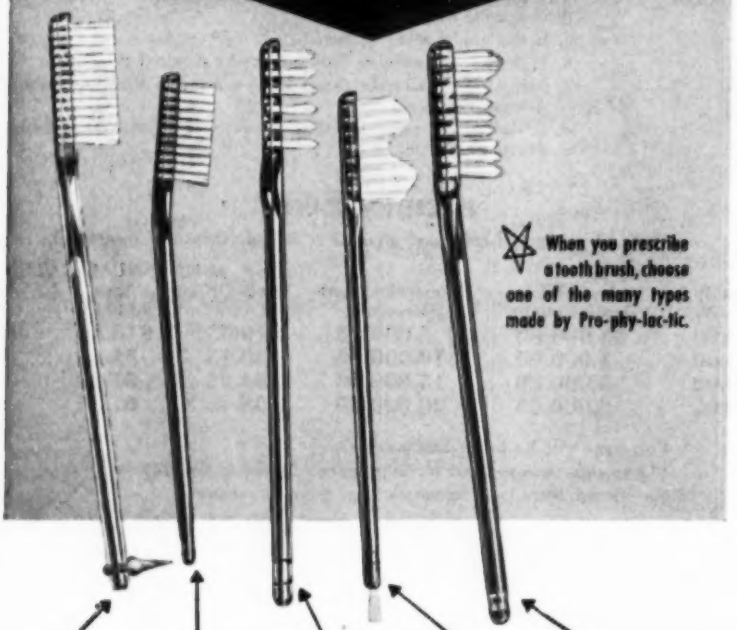
M. A. GESNER INC.

150 East Superior Street **WHitehall 3-1525** **Chicago 11, Ill.**

Since the National Casualty Company's plan of accident and health insurance is now in effect in New York, New Jersey, California, Utah and Nevada, the Association Plan is not available in those states.

WE'D LIKE YOU TO KNOW
THE ENTIRE

PRO-PHY-LAC-TIC FAMILY!



When you prescribe a tooth brush, choose one of the many types made by Pro-phy-lac-tic.

PRO "59" regular and medium sizes. Softer, finer, multiple bristle. Stimulator Tip on handle.

PRO "59" child's size. Softer, finer multiple bristle.

PRO 2-Row "Professional" with natural bristle.

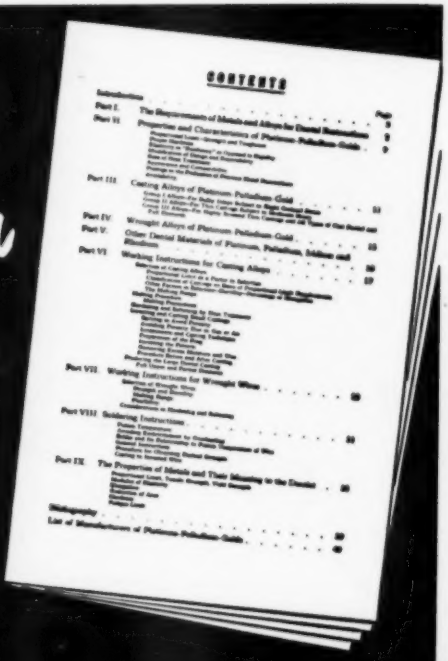
PRO Denture Brush. Specially designed bristles on handle for cleaning clasps and attachments.

PRO Tufted Brush, natural or Prolon bristle.

PRO-PHY-LAC-TIC BRUSH COMPANY

Division of The Lambert Company, Florence, Mass.

Reference Information on Precious Metals in Dentistry



"Platinum–Palladium–Gold in Dentistry," was compiled in order to classify and simplify the extensive information on precious metals as an aid to dentists and technicians.

Here's what it contains–

- It describes the characteristics of the alloys and their suitability for different types of prosthetic dentistry and orthodontia.
- It gives instructions for investing, casting, soldering, softening, hardening, and otherwise working cast and wrought alloys.
- It defines and analyzes the significance of the strength properties quoted by dental gold manufacturers.

All in all, you'll find this forty-page book a clearly written, valuable and informative reference.

Use the handy coupon to order your free copy now.

Platinum Metals Division
The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

Please send me my free copy of "Platinum-Palladium-Gold in Dentistry."

*Name*_____

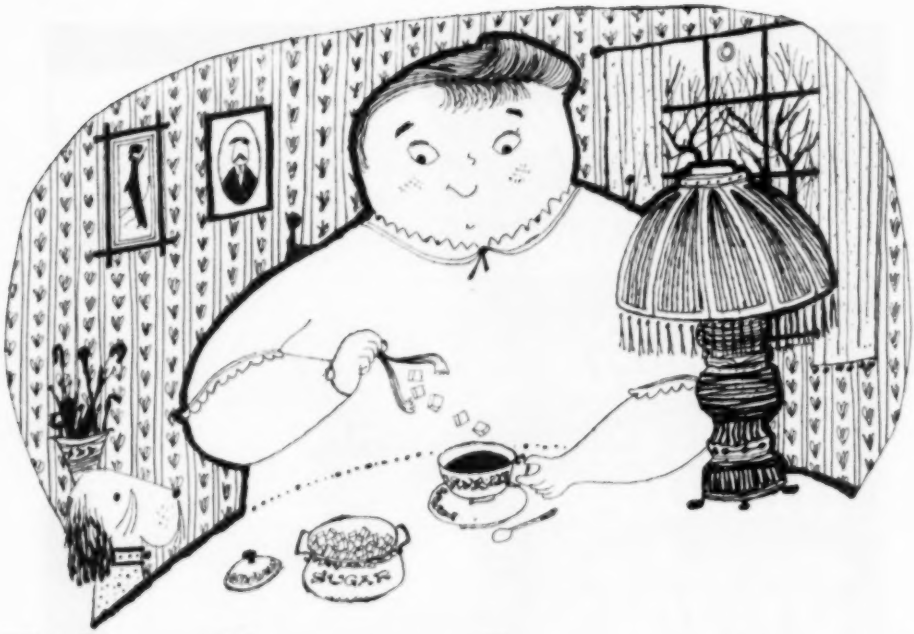
*Street*_____

*City*_____

*State*_____

Platinum Metals Division

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall Street, New York 5, N. Y.



When Sugar is Contraindicated

...BUT THE PATIENT CRAVES SWEETS

LET your sugar-restricted dieters satisfy their craving for sweets, without adding to sugar or caloric intake. Recommend SUCARYL, the non-caloric sweetener that has the clean sweet taste of sugar, with no bitter aftertaste in ordinary use. A great variety of fully-sweetened dishes are possible with SUCARYL, because its heat stability permits use in all cooking, baking and canning processes without loss of sweetness. SUCARYL Sodium Tablets, in bottles of 100 and 1000; and SUCARYL Sweetening Solution, both sodium and calcium forms, in 4-fluidounce bottles.

NEW RECIPE BOOKLET now available for your patients. To obtain a free supply, write Abbott Laboratories, North Chicago, Illinois. Abbott

SUCARYL®

(CYCLAMATE, ABBOTT)

I-160

NON-CALORIC SWEETENER FOR SUGAR-RESTRICTED DIETS

CONFIDENCE··

with CO-RE-GA

You can prescribe Co-re-ga. with confidence in its quality and effectiveness, and in its strict adherence to the highest standards of ethical conformance. Co-re-ga (in turn) can help strengthen your new denture patients' confidence in your dentures and your professional skill, by easing the difficult period of initial adjustment.

CO-RE-GA

CO-RE-GA IS NOT ADVERTISED TO THE PUBLIC

Accepted
COUNCIL on DENTAL THERAPEUTICS
AMERICAN DENTAL ASSOCIATION

Please send complimentary professional samples.

Dr. _____

PLEASE PRINT

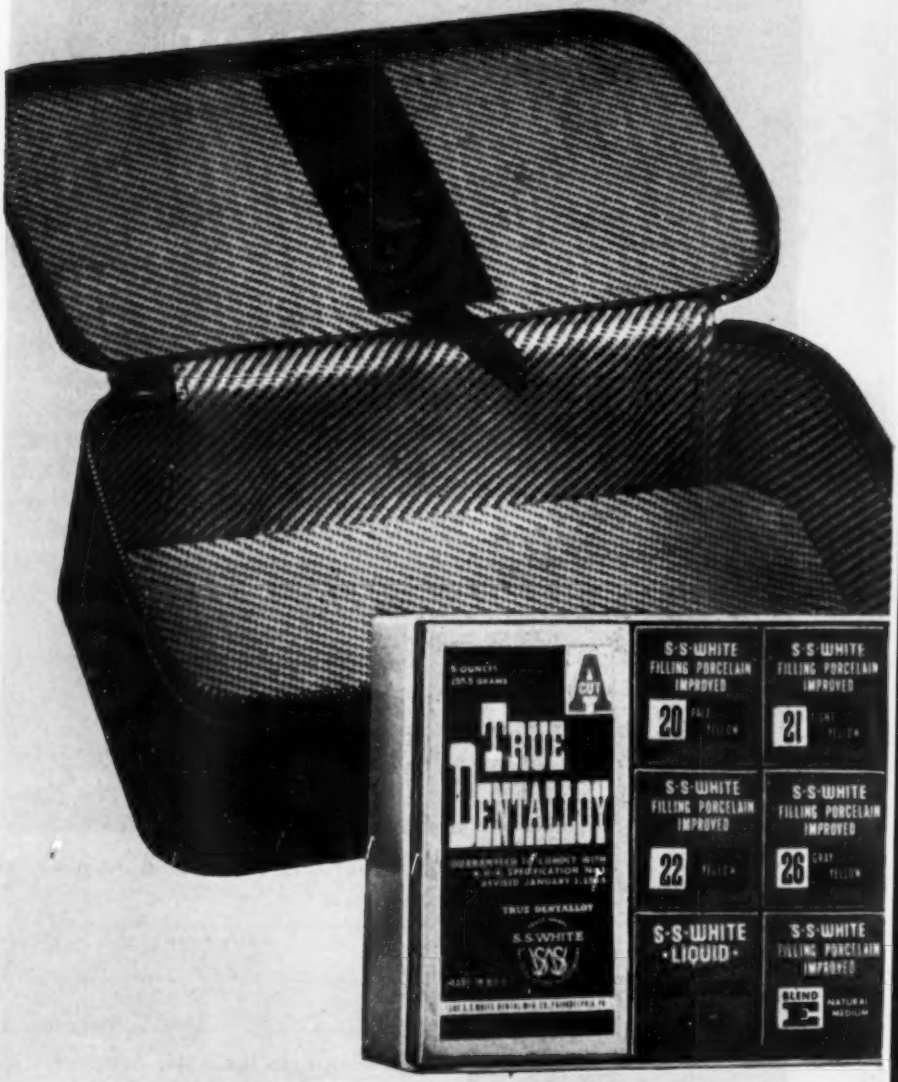
Address _____

City _____ Zone ____ State _____

23-F

COREGA CHEMICAL CO. • 76 MILL ROAD • JERSEY CITY 2, N. J.

STILL TIME TO GET YOURS!



Order from your Regular Salesman

Filling Material

KIT No. 1

TRUE DENTALLOY AND FILLING PORCELAIN IMPROVED IN A USEFUL CONTAINER

Offer expires June 30th 1953!

The Kit includes:

- 2 Five-ounce bottles of True Dentalloy "A" Cut
- 1 Powder each Filling Porcelain Improved Nos. 20, 22, 26, A and E
- 2 Powders Filling Porcelain Improved No. 21
- 2 Filling Porcelain Improved liquids

Packed in an attractive zipper case, lined to resist moisture and stain

VALUE $49.00 *Price $40.00*

TRUE DENTALLOY

Well known for its superior qualities. Mixes smooth. It carves like wax, takes a brilliant, lasting polish and is silver white in color. An expansion of 6 microns assures tight adaptation to cavity walls and floor.

S. S. WHITE FILLING PORCELAIN IMPROVED

Has more than enough strength to withstand masticatory stresses even in large cavities. It has high resistance to oral fluids and there is no recurrence of decay in cavities filled with it. Filling Porcelain Improved restorations are life-like and enduring.

Trade Mark: True Dentalloy

THE S. S. WHITE DENTAL MFG. CO., PHILADELPHIA 5, PA.

Beautiful denture or
"office headache" in the
"6-months-after"
test?
Mouth changes can't be prevented – but *denture changes should be* – if many refitting problems are to be avoided. "Six-months-after", it's distressing to find delicately molded ridges worn away, and the denture's meticulous fitting destroyed, by harsh abrasive scrubbing.
Yet – how easily this can be prevented, "six-months-after" or "six-years-after", by recommending Polident to your patients.
The Polident "soak-and-rinse" method floats away debris gently, yet effectively – removes stains, and destroys every odor. It keeps dentures sparkling clean and abrasion-free... helps keep refitting problems to a gratifying minimum.
Send for free supply of office samples
HUDSON PRODUCTS • JERSEY CITY 2, N. J.
Recommended by more dentists than any other denture cleanser
POLIDENT
POLIDENT
J-63

DENTAL COTTON ROLLS
DENTAL DIVISION

MIZZY DENTAL PRODUCTS

A few time-tested aids for the dental profession, each proven in the rigorous laboratory of day-to-day use for thousands of practitioners.

● FLECK'S CEMENT

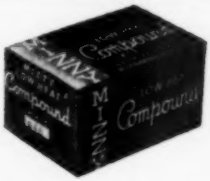
● TRU-RIDGE IMPRESSION PASTE

● ORADENT TOPICAL ANESTHETIC

● TAGGART'S (BLUE) INLAY CASTING WAX

MIZZY

FLEXO AND CONICAL NEEDLES

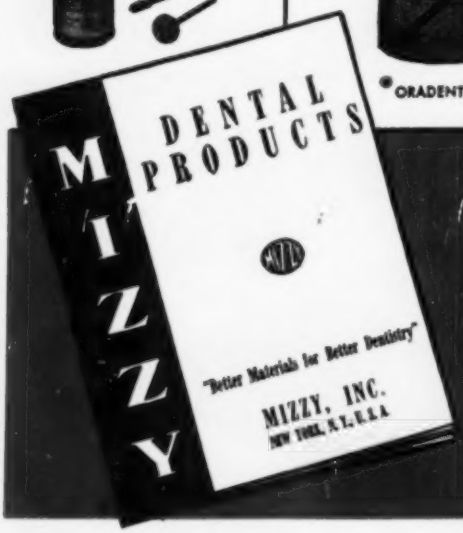


● LOW HEAT COMPOUND

● MOUNTED POINTS

● ORADENT ANESTHETIC

● FLEXIBLE GUARD



Each product is the result of intensive research and clinical investigation, and is, we believe, the finest available on the market. You can always be sure of satisfaction when you specify a dependable MIZZY product.

MIZZY, INC.
304 E. 23rd ST.
NEW YORK 10, N.Y.

Better Materials for Better Dentistry

Specify

DIALON

WITH MOLECTITE*

THE NEW C-P-M PLASTIC

Made specifically for your finest

JACKETS
VENEERS
BRIDGES

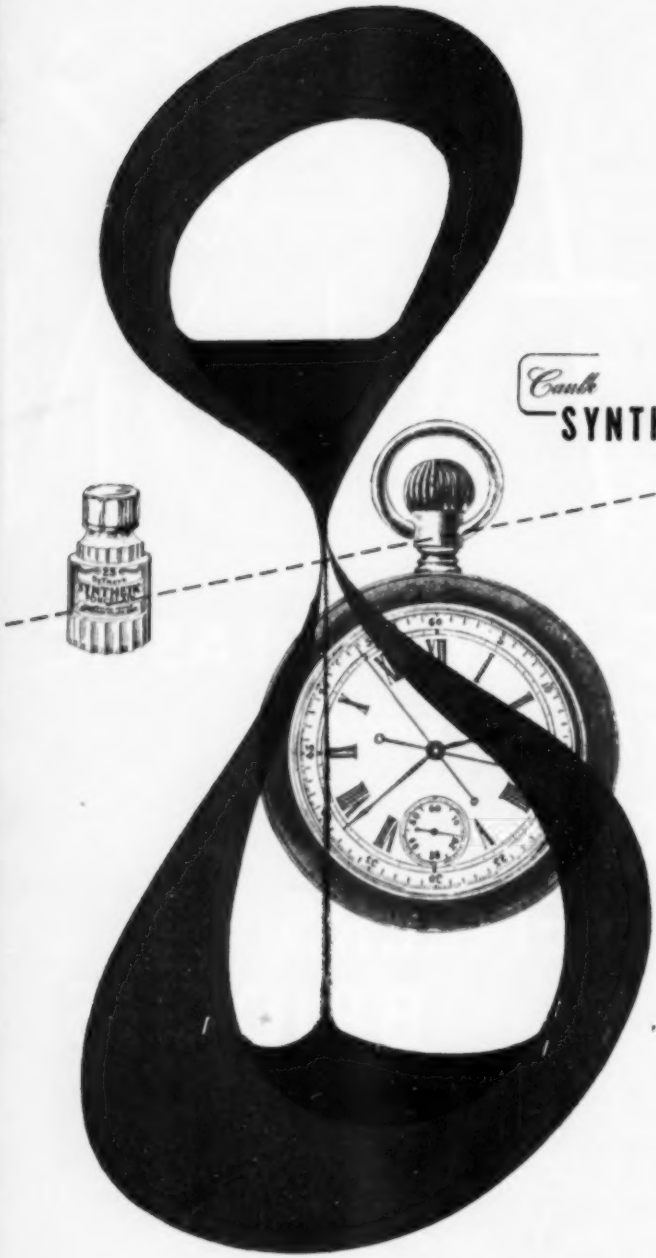
- CHEMICALLY: Insoluble • Craze-Proof.
- PHYSICALLY: Color-Stable • Abrasion-Resistant.
- MECHANICALLY: Rigid • Strong • Hard.

*CONSULT YOUR TECHNICIAN FOR ADDITIONAL DETAILS

Amco

AMERICAN CONSOLIDATED DENTAL CO.

835 NORTH NINETEENTH ST. • PHILADELPHIA 30, PA.



Twin Gains in Silicate Restorations with

Caulk SYNTHETIC PORCELAIN

Faster Color Matching

Tedious, time-consuming color blending may now be forgotten. A *single* Synthetic Porcelain powder selected with the aid of the "Direct Matcher" Shade Guide enables the dentist to *precisely match* the color of any tooth.

Longer Lasting Restorations

Clinical experience with Synthetic Porcelain restorations indicates that washing out is resisted for upward of 20 years. This striking durability is traced to the fact that Synthetic Porcelain has much lower solubility than any other silicate tested.

For modern materials call on **CAULK**
Milford, Delaware

—notably safe and effective
whenever laxation is indicated—

Phospho-Soda (fleet)®

Phospho-Soda (Fleet) is a solution containing in each 100 cc. sodium biphosphate 48 Gm. and sodium phosphate 18 Gm. 'Phospho-Soda' and 'Fleet' are registered trademarks of C. B. Fleet Co., Inc.

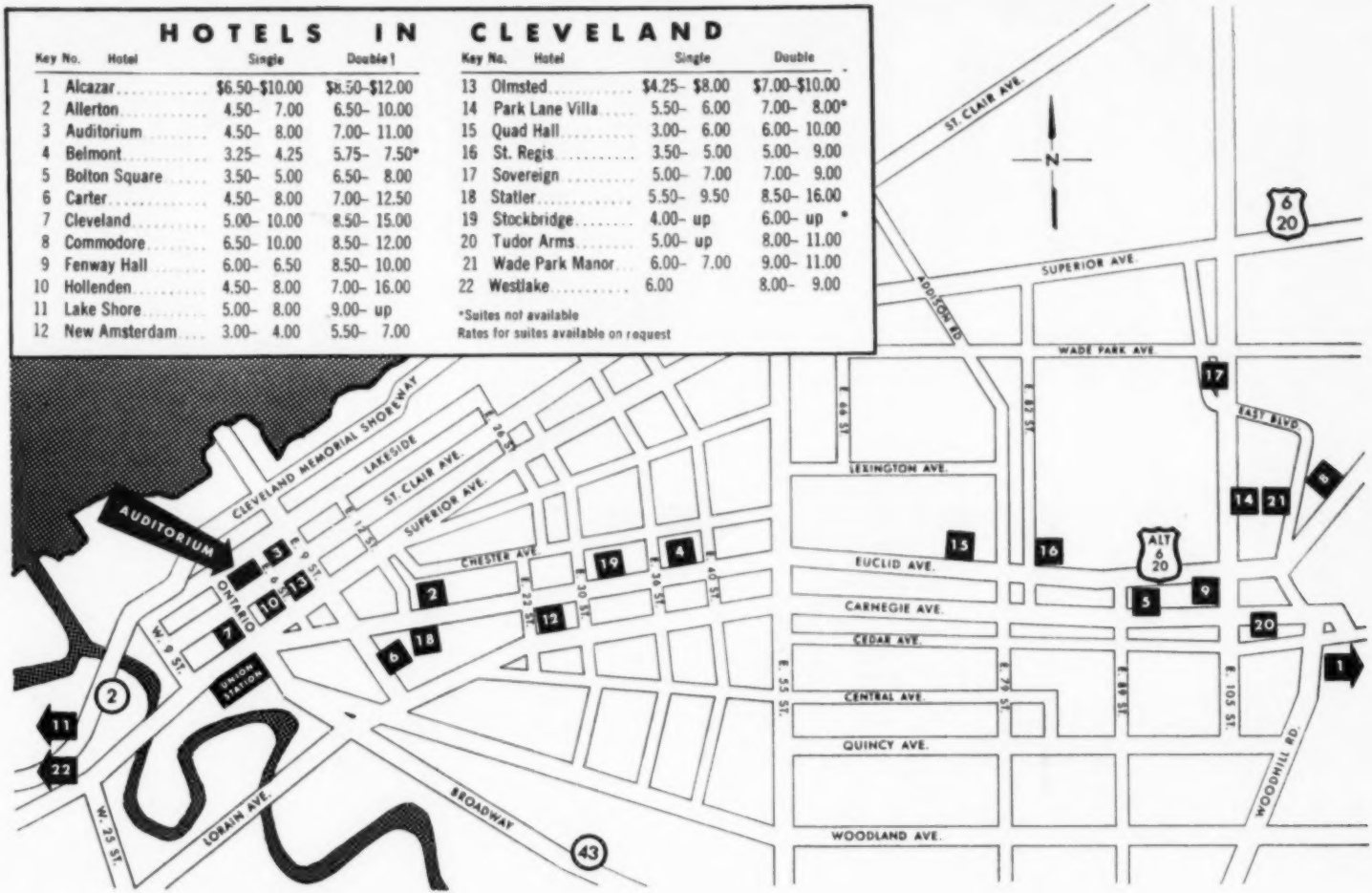
C. B. FLEET COMPANY, INC.
Lynchburg, Virginia

THERE IS ONLY *one* PHOSPHO-SODA (FLEET)

HOTELS IN CLEVELAND

Key No.	Hotel	Single	Double†
1	Alcazar	$6.50-$10.00	$8.50-$12.00
2	Allerton	4.50- 7.00	6.50- 10.00
3	Auditorium	4.50- 8.00	7.00- 11.00
4	Belmont	3.25- 4.25	5.75- 7.50*
5	Bolton Square	3.50- 5.00	6.50- 8.00
6	Carter	4.50- 8.00	7.00- 12.50
7	Cleveland	5.00- 10.00	8.50- 15.00
8	Commodore	6.50- 10.00	8.50- 12.00
9	Fenway Hall	6.00- 6.50	8.50- 10.00
10	Hollenden	4.50- 8.00	7.00- 16.00
11	Lake Shore	5.00- 8.00	9.00- up
12	New Amsterdam	3.00- 4.00	5.50- 7.00
13	Olmsted	$4.25- $8.00	$7.00-$10.00
14	Park Lane Villa	5.50- 6.00	7.00- 8.00*
15	Quad Hall	3.00- 6.00	6.00- 10.00
16	St. Regis	3.50- 5.00	5.00- 9.00
17	Sovereign	5.00- 7.00	7.00- 9.00
18	Statler	5.50- 9.50	8.50- 16.00
19	Stockbridge	4.00- up	6.00- up *
20	Tudor Arms	5.00- up	8.00- 11.00
21	Wade Park Manor	6.00- 7.00	9.00- 11.00
22	Westlake	6.00	8.00- 9.00

*Suites not available
Rates for suites available on request



Hotel reservation application

94th Annual Session
American Dental
Association
Sept. 28—Oct. 1, 1953
Cleveland, Ohio

INSTRUCTIONS: Reservations for hotel accommodations may be secured by completing this application and mailing it to: A.D.A. Housing Bureau, 511 Terminal Tower, Cleveland 13, Ohio.

Be sure to indicate your arrival time in Cleveland. Reservations will be held only until 6 p.m. of the day you indicate when you will arrive in Cleveland. Failure to notify the hotel of any last minute change in your arrival time may result in cancellation of the reservation.

Names of all persons who intend to occupy the accommodations must be listed on the application.

List four choices of hotels. Confirmation will be sent to the applicant indicating which hotel has accepted the reservation.

Write the A.D.A. Housing Bureau in Cleveland if you wish to cancel the reservation.

A.D.A. Housing Bureau • 511 Terminal Tower, Cleveland 13, Ohio

(Please print or type) A.D.A.

Applicant:

Name _____

_____
(Street address) (City) (Zone) (State)

Arrival in Cleveland _____ a.m. p.m. Leaving _____

Accommodations:

Hotel _____ (First choice) Hotel _____ (Third choice)

Hotel _____ (Second choice) Hotel _____ (Fourth choice)

☐ Single occupancy, rate to range from $ _____ to $ _____ per day.

☐ Double occupancy, double bed, rate to range from $ _____ to $ _____ per day. } 2 names must be listed below

☐ Double occupancy, twin beds, rate to range from $ _____ to $ _____ per day. }

☐ Suite of _____ rooms, including parlor, rate to range from $ _____ to $ _____ per day.

Occupants: (use an extra page for listing additional names if necessary)

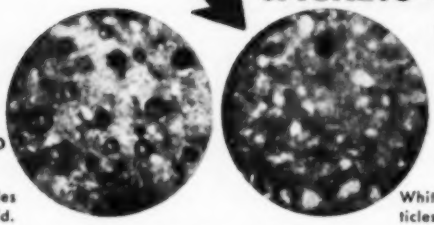
Room will be occupied by:

_____
(Name) (Address) (City) (State)

_____
(Name) (Address) (City) (State)

Why You Should Use
NU-DENT VACUUM FIRED PORCELAIN

JACKETS-BRIDGES
VENEERS
INLAYS



CONVENTIONALLY FIRED PORCELAIN

Large spots are air bubbles which pockmark entire field.

NU-DENT VACUUM FIRED PORCELAIN

White flecks are quartz particles. Note dense structure.

These photomicrographs were made under polarized light at 200X. Reproduced here reduced one-third.

NU-DENT Vacuum Fired Porcelain Restorations possess esthetic qualities and physical properties unattainable in conventionally fired porcelain —

- **A Vibrant Brilliance and Translucency.**
- **Exquisitely Natural Shading.**
- **Freedom from Pits, Pores and Air Pockets.**

See Comparative Photomicrographs above.

- **Notably Increased Strength, Hardness, Density.***

All these superlative qualities result from the removal of gases and entrapped air from the porcelain by the high vacuum (635 mm. mercury) in which it is fired.

VACUUM Firing of Hand-Carved Porcelain Restorations was originated by Nu-Dent, who developed the special high fusing porcelains necessary for accurate shade control; developed the process; and designed and built the special high vacuum firing furnaces.

Genuine, Vacuum Fired Porcelain Restorations are obtainable only from Nu-Dent Porcelain Studios. However —

Wherever You Practice, You Can Have Nu-Dent's Genuine, Vacuum Fired Porcelain Restorations.

Two Strategically Located Studios and Use of Air Mail Delivery, where feasible, Assure Prompt, Efficient Service. Ask about our "Mailing Aids" and How They Simplify Mailing Your Cases to Us.

TRY A NU-DENT VACUUM FIRED JACKET — *You Can Even SEE the Difference.*

Write Studio Nearer You for Literature and Price List.

NU-DENT VACUUM FIRING FURNACE (Patented)

PROCESS PATENT PENDING

*Report by nationally recognized testing laboratory sent on request. Nu-Dent Vacuum Fired Porcelain is so hard and dense that, if ground, it can be repolished to a high glaze with fine pumice and a felt wheel.

ALL NU-DENT PORCELAIN RESTORATIONS ARE NOW VACUUM FIRED

NU-DENT PORCELAIN STUDIO, INC.

CALIFORNIA
139 South Beverly Drive
Beverly Hills, Calif.
CRestview 5-8717
BRadshaw 2-1851

NEW YORK
Candler Building
220 West 42nd Street
New York 36, N. Y.
LAckawanna 4-3591 to 6

INDEX TO ADVERTISEMENTS

June 1953

Abbott Laboratories....A-54
American Consolidated Dental Co....A-61
American Dental Association....A-8, A-17, A-26, A-31, A-34, A-64, A-65
Ash, Sons & Co., Inc., Claudius....A-47
Astra Pharmaceutical Products, Inc....A-12, A-13
Austenal Laboratories, Inc....A-3, A-44, A-45

Baker & Co., Inc....A-43
Bristol-Myers Co....A-16

Castle Co., Wilmot....A-6
Caulk Co., L. D....A-48, A-62
Classified Advertising....A-32, A-33
Coe Laboratories, Inc....A-21
Coles Corporation....A-31
Columbus Dental Mfg. Co....A-15
Cook-Waite Laboratories, Inc....A-14
Corega Chemical Co....A-55
Cosmos Dental Products, Inc....A-5
Crescent Dental Mfg. Co....A-11

Dental Absorbents Co....A-22
Dental Perfection Co....A-9
Dentists' Supply Co. of New York, The....2nd Cover, 4th Cover
Dresch Laboratories Co....A-19

Fleet Co., Inc., C. B....A-63
Flossy Dental Corp....A-25

General Electric Co....A-18
Gesner, Inc., M. A....A-51
Getz Corp., The William....A-7

Hudson Products....A-58

International Nickel Co., Inc., The....A-53
Interstate Dental Co....A-42
Invincible Metal Furniture Co....A-25

Jelenko & Co., J. F....A-1
Johnson & Johnson....A-59

Lauer Metal Shop....A-34
Luxene, Inc....A-35, A-36, A-37, A-38

Macmillan Co., The....A-4
Medical Protective Co....A-26
Merck & Co., Inc....A-39
Mizzy, Inc....A-60
Mosby Co., C. V....A-27

National Dairy Council....A-28
Ney Co., The J. M....A-23
Novocol Chemical Mfg. Co., Inc....A-29
Nu-Dent Porcelain Studio....A-66

Physicians Casualty & Health Association....A-25
Professional Printing Co....A-22
Pro-phy-lac-tic Brush Co....A-52

Ransom & Randolph Co., The....A-49
Richmond Dental Cotton Co....A-46
Rinn X-Ray Products, Inc....A-24
Ritter Co., Inc....A-2
Rower Dental Mfg. Corp....A-26

Squibb & Sons, E. R....A-10
Staples Press, Inc....A-22

Ticonium....A-30

U. S. Defense Bonds....A-20

Wallace & Tiernan Co., Inc....A-50
Wernet Dental Mfg. Co., Inc....A-40, A-41
White Dental Mfg. Co., The S. S....A-56, A-57

PILKINGTON-TURNER

VACUUM-FIRED 30

Posterior

OFFER A NEW POTENTIAL IN YOUR FULL AND PARTIAL DENTURE PRACTICE

A NEW SERIES OF BICUSPIDS AND MOLARS DESIGNED TO FUNCTION IN ACCORDANCE WITH THE ANATOMICAL REQUIREMENTS OF MANDIBULAR MOVEMENTS. OCCLUSAL PLANES ARE MACHINE CUT FOR GREATER EFFICIENCY WITH A COMPLETE NEW CLEARANCE SYSTEM WHICH ELIMINATES INTERFERENCE.

Scientifically designed to meet the anatomical requirements of the mandibular movements of the greatest majority of patients.

In performance and function they provide maximum masticating efficiency in the artificial dentition.

Available in a range of moulds and sizes for all average cases.

Vacuum fired in eight popular shades of the Trubyte Bioform Natural Tooth Color System.

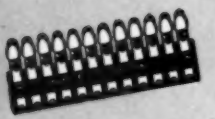
The first posterior design which incorporates the anatomy and esthetics of the natural buccal slope of the bicuspids.

Natural bucco-lingual widths which offer a new flexibility of use in partial denture work.

Engineered occlusal surfaces, narrow occlusal contacts, adequate clearance ways and ample food table assure greater comfort for the patient.

A new scientific design which provides a new degree of simplicity in set up, teeth go to place more easily, corrective milling and grinding is reduced to a minimum.

Vacuum fired by an exclusive, patented process which produces denser, more vital porcelain than ever before made available in posterior teeth.



The first full blending of shades ever available in posterior teeth, assured by the controlled placement of enamel and body porcelains — a new degree of accuracy in color selection and matching to anteriors.

AVAILABLE NOW FROM YOUR TRUBYTE DEALER

THE DENTISTS' SUPPLY COMPANY

OF NEW YORK

YORK, PENNSYLVANIA